# TEACHER'S GUIDE


## to the Alaska Benchmark Examination Grade 6

State of Alaska
Department of Education
& Early Development

# LETTER FROM THE COMMISSIONER

Dear Teacher:

This Teacher's Guide to the Alaska Performance Standards and the Alaska Benchmark Examination in Reading, Writing and Mathematics is designed to help you assist students to do their best on the Alaska Benchmark Examinations. There are three guides in this series—one for students in grade three, another for grade six and a third for grade eight.

This publication is the latest in a series of "bridge materials" that the Department of Education & Early Development has published to help increase student performance by "bridging" the learning gap between the Alaska Student Performance Standards in reading, writing and mathematics and the examinations that measure how well students are learning the standards.

This guide presents excellent ideas and activities on how to teach the concepts and skills specified in each of the Alaska performance standards. It also presents the best thinking of a group of teachers who are also content specialists. This group developed the ideas and activities over a period of time in 2001.

The publication can be placed in a three-holed binder. As time goes on, you can insert additional activities that prove effective for you and other teachers.

I thank the dozens of teachers and administrators who have contributed their time and expertise to this project. I also applaud all of you who are helping make our schools top quality places for students to learn.

Sincerely,

Shirley J. Holloway

Shirley J. Holloway, Ph.D.
Commissioner of Education & Early Development

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# INTRODUCTION

## WHAT THIS TEACHER'S GUIDE CAN DO FOR YOU

Dear Teacher,

If you have questions about the Alaska Performance Standards and the Benchmark Examinations that will measure how well your students are reaching those standards, this guide should answer many of them.

Parts 1, 2, and 3 of the guide share ideas from master teachers that will help you prepare your students to meet the Alaska Performance Standards in Reading, Writing, and Mathematics. They include **Suggested Activities** for teaching each standard, examples of the **kinds of test questions** used to assess students on particular standards, and some **specific information about the tests** in each subject area. In addition:

- **Frequently Asked Questions**, immediately following this introduction, offer overall information about the Benchmark Exams.
- **Glossaries** in Part 4 clarify the uses of certain terms for Reading, Writing, and Mathematics.
- **Resources for Teachers** in Part 4 list publications and web sites you may find helpful in teaching Reading, Writing, and Mathematics.
- In Appendix 1 you will find charts showing the **Alaska Content and Performance Standards in Reading, Writing, and Mathematics** for students of all ages.
- In Appendix 2 you will find the complete **Practice Tests, Scoring Guides,** and **Test Item Maps** for the Grade 6 Benchmark tests.
- In Appendix 3 you will find **Proficiency Descriptors** that will help you gauge your students' competencies in specific subject areas.
- And in Appendix 4 an **Overview of Standards and the Comprehensive System of Student Assessment in Alaska** will give you a sense of how Alaska's standards and exams were developed and how they fit into students' progress from kindergarten through grade 12.

You, your students, parents, and other members of your community can also access nearly all this information on the Department of Education & Early Development web site *(www.eed.state.ak.us)*.

We hope this guide will give you some new ideas for teaching the content and skills reflected in the statewide standards and help you prepare your students to succeed on the Grade 6 Benchmark Exam. Ideally, it will provide many opportunities for your students to demonstrate what they know and for you to discover what more they may need to know to meet and exceed the expectations expressed in the Alaska content and performance standards.

## KEY TO NUMBERING OF THE ALASKA PERFORMANCE STANDARDS

This guide numbers the Alaska Performance Standards according to the system used in the tables of Alaska Performance Standards on the Department of Education & Early Development web site *(www.eed.state.ak.us)*. Please note that the number systems for Reading and Writing differ from the system for Mathematics.

### FOR READING AND WRITING

- The initial letter R or W indicates the subject area, Reading or Writing
- The first numeral indicates the age level
  - 1 = ages 5-7, assessed in grade 3
  - 2 = ages 8-10, assessed in grade 6
  - 3 = ages 11-14, assessed in grade 8

- The second numeral (sometimes followed by "a" or "b") indicates the performance standard

Thus, a standard numbered R2.1b refers to Reading Performance Standard 1 for students ages 8-10.

## FOR MATHEMATICS

- The initial letter A refers to the first Mathematics content standard.
- The first numeral indicates one of the six key elements under Mathematics Content Standard A. Those elements include:
  - 1—Numeration
  - 2—Measurement
  - 3—Estimation and Computation
  - 4—Functions and Relationships
  - 5—Geometry
  - 6—Statistics and Probability.
- The second numeral indicates the age level, using the numbers 1, 2, and 3 linked to the same age groups as in the Reading and Writing Performance Standards.
- The third numeral indicates the Mathematics Performance Standard under a particular key element.

Thus, a standard numbered A5.2.4 refers to Mathematics Performance Standard 4 under key element 5—Geometry, for students ages 8-10.

# FREQUENTLY ASKED QUESTIONS

**Q A**

**What do the Alaska Benchmark Examinations measure?**

The Alaska Benchmark Examinations measure whether students are achieving statewide academic standards in reading, writing, and math. The standards are benchmarked at three age levels: ages 5-7 (tested at grade 3); ages 8-11 (tested at grade 6); and ages 11-14 (tested at grade 8). Students will need to pass a fourth exam in reading, writing, and math before they can qualify for a high school diploma. The fourth exam is called the Alaska High School Graduation Qualifying Examination.

**Q A**

**Why do we have the Alaska Benchmark Examinations?**

The Alaska Legislature authorized the exams, and the State Board of Education & Early Development sets the policy for their development. The Department of Education & Early Development contracted with CTB/McGraw-Hill, a commercial test publisher, to develop the examinations.

**Q A**

**How will Alaskans know whether the Alaska Benchmark Examinations are appropriate for students in our state?**

The State Board of Education & Early Development appointed several committees of Alaskans to review the work of the test publisher. The committees made sure the examinations are fair for all students in Alaska and that they measure the levels of achievement that Alaskans expect of their young people at certain points in their schooling. The committees also looked at such issues as test bias and alignment with the Alaska Performance Standards in Reading, Writing, and Mathematics.

**Q A**

**Will there be any financial cost to parents or students for taking the Alaska Benchmark Examinations?**

No.

**Q A**

**How long will students spend taking tests?**

No time limit will be set for finishing a test. Students may take as long as they need to complete it. However, most students can expect to spend two or three hours to complete each of the three tests. School districts may administer one test per day over a three-day period, or they may choose to subdivide the tests and administer them in shorter sessions over a five-day period.

**Q A**

**What kinds of questions will be on the Alaska Benchmark Examinations?**

There will be three types of questions on all the Benchmark Examinations: multiple- choice, short "constructed-response," and extended "constructed-response." Multiple- choice questions will offer three or four answer choices; students will select the best answer and mark the appropriate circle. For "constructed-response" questions, students will write their answers on lines or in spaces provided. Short "constructed-response" questions will require a few words, phrases, or sentences; that a problem be solved; or that a form or chart be completed. They may take two to five minutes to complete. Extended "constructed-response" questions may require students to write a paragraph, an essay, or a story; or to complete a multi-step task. They may require 15 minutes to an hour to complete. Constructed-response questions in mathematics will require students to show their work.

**Q A**

**How will students, parents, and school districts learn the results of the Alaska Benchmark Examinations?**

The Department of Education & Early Development will coordinate the administration, scoring, and reporting of the Alaska Benchmark Examinations. Following the administration and scoring of the examinations, the department will report test results for individual students, schools, and school districts. The reports will provide information about student strengths and weaknesses in reading, writing, and mathematics and how they relate to specific performance standards that were developed for Alaska students.

**Q A**

**What are passing scores on the Alaska Benchmark Examinations?**

There are no passing scores. Instead, students can demonstrate four different levels of performance on each subject area test: advanced, proficient, below proficient, and not proficient. Several committees involving some 250 Alaska educators, parents, Native leaders, business leaders, and others recommended the points (or "cut scores") that would separate each proficiency level from the others. The scores were later adopted by the State Board of Education & Early Development.

**Q A**

**What else do the four performance levels show?**

The committees that established what scores would distinguish between performance levels also developed "proficiency descriptors." These describe what students at each proficiency level can do in terms of the content and skills that are assessed on the Benchmark Examinations. The descriptors can help teachers, parents, and students determine what students need to practice to progress academically and meet the performance standards for each subject area and grade level.

# PART ONE
## Reading

## WHAT THE READING TEST WILL BE LIKE

The Reading Test of the Grade 6 Alaska Benchmark Examination will assess students' ability to:

- comprehend text and determine the meaning of new words;
- infer meaning from text and identify themes;
- summarize information or ideas and make connections with related information or experience;
- read and follow multi-step directions;
- define and identify plots, settings, and characters, and explain the characteristics of genres; and
- differentiate fact from opinion.

## TYPES OF QUESTIONS

The Reading Test will include:

- about 30 multiple-choice questions in which students will be asked to select the best answer from a list of three or four possible answers;
- about five short "constructed-response" questions in which students may be asked to write their answers in a few words, phrases, or sentences; or to draw a picture and tell about what they drew; or to complete a graph or chart;
- one extended "constructed-response" question that will ask students to write a longer response to a prompt.

Questions in the Reading Test will be based on short passages of reading, which may include fiction, non-fiction, and other genres.

## SCORING

Students' answers to multiple-choice questions in the Reading Test will be scored according to an answer key. Correct answers will receive one point; incorrect answers will receive no points.

Readers will score students' answers to short and extended "constructed-response" questions by comparing them to item-specific scoring guides, which show exemplary responses and provide guidelines for the number of points to be awarded. *(See sample scoring guides at the end of the Reading Practice Test in Appendix 2 of this guide.)*

## REPORTING STUDENTS' SCORES

Each student's scores for the Reading Test will provide three kinds of information:

- an overall score
- one of four proficiency ratings:
  - advanced
  - proficient
  - below proficient
  - not proficient
- information about how well the student scored on each of the reading standards assessed by the test.

*(For more information about proficiency levels and how student scores relate to performance standards, see the Proficiency Descriptors in Appendix 3 at the back of this guide.)*

## TIME AND MATERIALS REQUIRED

Students may take as long as they need to complete the Reading Test, but most students should be able to finish in two to three hours. All necessary materials will be provided. Students are not allowed to use dictionaries, thesauruses, or other reference materials during the test, except in some cases, as in accommodations for students with disabilities. *(See* Participation Guidelines for the Inclusion of Special Education and LEP Students in State Assessments *under* "Student Testing" *on the Department of Education & Early Development web site,* (www.eed.state.ak.us).

# PREPARING STUDENTS
## to Meet Specific Standards in Reading

This section describes activities that teachers can use to help their students meet each of the Reading Performance Standards for students ages 8-10 (tested on the Grade 6 Benchmark Examination). Suggested activities are keyed to specific performance standards, which are spelled out in the lefthand column adjacent to them.

This section also includes sample test items from the Reading Practice Test for Grade 6, and some explanations of how specific test items relate to specific performance standards.

*(The Alaska Reading Performance Standards for students at all age levels can be found in Appendix 1 at the back of this guide; on the Department of Education & Early Development web site* (www.eed.state.ak.us) *under* "Standards for Student Learning"; *and in the booklet* Standards for Alaska Students, *Alaska Department of Education & Early Development, February 1999.)*

*(The complete Reading Practice Test and Scoring Guides for the Grade 6 Benchmark Exam can be found in Appendix 2.)*

### PURPOSE

Students develop proficiency in reading as they expand their understanding of the reading process and learn to use a variety of reading strategies. Students who have this understanding and skill:

- understand phonetics, language structure, and semantics;
- understand text structure such as illustrations, graphs, and headers;
- use strategies for self-monitoring and self-correcting; and
- can read fluently at grade level.

# SUGGESTED ACTIVITIES

### PERFORMANCE STANDARD: R2.1a

Students can use a combination of the following to read and comprehend text:

- knowledge of phonetics, language structure, and semantics;
- text structures such as illustrations, graphs, and headers;
- self-monitoring and self-correcting strategies;
- adjusting reading pace or style based on purpose, task, and type of text.

**Using skills to read and comprehend text**

- Encourage students to use new concepts in a variety of ways. If spelling and vocabulary are part of the ongoing curriculum, students could add new words on a weekly basis.
- Take any reports students make from information searches and create a classroom encyclopedia. Have students share their new information with others.
- Provide each student with a copy of a folktale. Ask students to read silently, but suggest that when they come to an unfamiliar word or phrase they try to substitute a synonym and continue reading. The main idea is that they understand the story, but they should lightly pencil in any significant words or phrases they find unfamiliar. Later have them discuss the language cues that helped them find out what the words or phrases mean. Have students write sentences using the new words or phrases they've learned and keep them in their notebooks as sources of discussion. Encourage students to incorporate the new words and phrases into their writing

### SAMPLE PRACTICE QUESTION

After reading the passage on "Snowboarding," students are asked a number of questions including:

2. Why was the winter in the story an unusual one for the narrator?

Ⓐ The narrator was a better student.

Ⓑ The narrator was shyer than usual.

Ⓒ There were changes in the narrator's family life.

Ⓓ There was more snow for the narrator to play in.

**Comments:** Practice Test item 2 relates to standard R2.1a because it requires students to use information from the text to determine the author's meaning.

## PERFORMANCE STANDARD: R2.1b

Students can use knowledge of word families, phonetics, context clues, visual cues, and structural elements to determine meaning of unfamiliar words.

### Determining meaning of unfamiliar words

- Use prediction activities: Write sentences with blanks for missing words. Have students use visual and context clues to find the words. Adding a mystery/detective aspect to the activity might be especially appealing to students this age.

## PERFORMANCE STANDARD: R2.2

Students can infer meaning from text.

### Inferring meaning from text

- Either read to students or have them read a text. Ask questions such as "What does _____look like?" "Do you think _____was friendly?" Be sure to ask questions that require students to think about what they have read and to go beyond the literal level of the text. Other questions to lead students beyond the literal level might be: What makes you think that? or What clues did the author give you that helped you figure that out?
- Discuss reading "on the lines," "between the lines," and "beyond the lines." Reading "on the lines" means *literal comprehension*—answering "who? what? when? where?" with information in the text. Reading "between the lines" refers to *inferential comprehension*—using information given in the text to determine other information, often about why or how something was done or is the way it is. Reading "beyond the lines" refers to drawing on one's own knowledge or experiences to expand understanding of the text. Literal and inferential comprehension are generally shared understandings. Reading "beyond the lines" is often quite personal and individual, although some inferences fall into this category.

### SAMPLE PRACTICE QUESTION

After reading the passage on "The Oak and the Reed," students are asked a number of questions including:

8. In the passage the oak tree snorts because

Ⓐ this is a sound that trees usually make

Ⓑ the tree thinks it is better than the reed

Ⓒ the tree does not agree with what the reed has said

Ⓓ the tree is showing that it is not afraid of the wind

**Comments:** Practice Test item 8 relates to standard R2.2 because it asks students to use information in the text to infer that the oak tree snorts to show his disagreement with the reed's comments. Students may also use knowledge from their personal experience to determine the meaning of the oak tree's snort. Practice Test item 3 also relates to this standard because it requires students to infer that the reason the narrator compared his snow-boarding to an Olympic performance was that he was doing really well at it.

## PERFORMANCE STANDARD: R2.3

Students can read texts aloud with rhythm, flow, and expression, demonstrating knowledge of punctuation and other conventions of print.

### Reading aloud competently

- Read out loud to students on a regular basis to model good oral reading.
- Have students read and perform plays, or participate in a readers' theater.
- Have students practice writing dialogue by rewriting a story or writing original plays.
- Provide opportunities for students to read to younger students. Encourage them to practice reading primary or picture books aloud, including reading into a tape recorder, in preparation for this activity.

## PERFORMANCE STANDARD: R2.4a

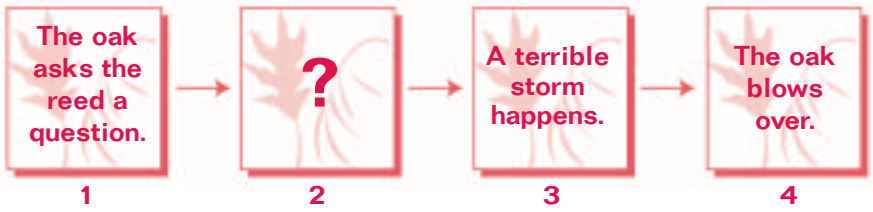
Students can retell stories in correct sequence.

### Retelling stories in correct sequence

- Have students work with primary children on sequencing and storytelling skills. One way to do this is for students to read a story to younger children, provide simple sketches of key events in the story, and help the younger children retell the story using the sketches.
- Have students create storyboards and present stories to an audience of their classmates or primary students
- Have students retell a story they have read using Power Point® software.
- Select an article that has an easily identifiable beginning, organizational sequence, and ending. Cut the story into sections depending on its complexity. (As students become more sophisticated, you can cut stories into greater numbers of sections.) Each section must be long enough to give students something substantial to read—even though they may be reading something from the middle of the article. Ask who has the beginning of the article. Have the student(s) responding read that portion, then have the group decide if that indeed is the beginning. Proceed through each section with a similar process. Using cut-up stories or other articles, students can work independently or in teams.
- Invite storytellers to class and have them give students pointers on good storytelling techniques and tips for recalling story sequences.

### SAMPLE PRACTICE QUESTION

9. Which of these should go in Box 2?




Ⓐ Breezes blow.

Ⓑ The reed stands tall again.

Ⓒ The reed defends its actions.

Ⓓ The oak and reed grow side by side.

**Comments:** Practice Test item 9 relates to standard R2.4a because it asks students to identify where in a sequence of events a particular event occurs by selecting an event to complete a story diagram for the passage.

## PERFORMANCE STANDARD: R2.4b

Students can restate and summarize information or ideas from text.

### Restating and summarizing information and ideas

- Have students read an article, then:
  - write three facts they learned,
  - pose two questions they still have, and
  - illustrate what they learned from the piece.
- On the internet or at the library have students take virtual field trips to two different locations (anywhere in the world). Have them select one location and write a descriptive summary of what they'd like to see if they could visit that place.

### SAMPLE PRACTICE QUESTION

After reading the passage on "Snowboarding," students are asked a number of questions including:

6. What are two ways that the child might have avoided falling into the hole? Use details from the story to explain your answer.

_____

_____

_____ *[More lines provided]* _____

**Comments:** Practice Test item 6 relates to standard R2.4b in that it asks students to tell how the character in the passage could have avoided a mishap, supporting their answers with details from the passage.

## PERFORMANCE STANDARD: R2.5

Students can locate evidence in the text and from related experiences to support understanding of a main idea.

### Locating evidence to support understanding

- This requires some good modeling from the teacher. Use a Read and Think Aloud activity to model the thinking process. Read a line or two aloud, then share your thinking with the class; for example, after reading a few lines of description you might say, "Oh, this must be a country road because the car windshield just got splashed with mud. City roads are usually paved, and they wouldn't have so much mud on them."

### SAMPLE PRACTICE QUESTION

After reading the passage on "The Oak and the Reed," students are asked a number of questions including:

10. Which of these statements best summarizes the moral of this story?

Ⓐ It is always best to be tall and straight.

Ⓑ It is better to be flexible than stubborn.

Ⓒ It is wise to be careful when dealing with tall trees.

Ⓓ It is better to know your own strengths than those of your friends.

**Comments:** Practice Test item 10 relates to standard R2.5 because it asks students to identify the moral of the story (which is also the main idea) based on information provided in the text. Practice Test item 12 also asks students to provide evidence from a text to support their understanding of a main idea.

## PERFORMANCE STANDARD: R2.6

Students can read and follow multi-step directions to complete a simple task.

### Reading and following multi-step directions

- Have students write steps telling how to make things (a peanut butter sandwich or a paper airplane, for example) so they realize the detail that must go into explaining a multi-step process. After they have refined their written directions, have students exchange papers and try to follow one another's instructions.
- Have students read and follow directions to create a form using origami.

## PERFORMANCE STANDARD: R2.7

Students can explain the characteristics of the following:

- fiction and non-fiction,
- prose and poetry, and
- four major genres of fiction: short story, drama, novel, and poetry.

### Understanding fiction and non-fiction

- Show students a few paragraphs about whales from an encyclopedia and the opening paragraph from Rudyard Kipling's "How the Whale Got His Throat." Discuss how the authors of the two pieces had different purposes for writing and how language was used in each case. "How does the author talk to the reader?" in other words. Discuss how illustrations can help the reader know fact from fiction, too.
- Have students take a news article from the newspaper and rewrite it as a piece of fiction, or have them take a comic strip (or television show) and rewrite it as if they were news reporters describing an incident that actually happened near their homes.
- Have students choose a favorite animal and find an encyclopedia article, a news article, and a poem about it. How did different authors handle the same content?

### Understanding prose and poetry

- Have students read and record poetry and prose, then ask them to analyze the differences they can hear between the two.
- Ask students to look at different writings of poetry and prose and have them make a T chart, listing similarities and differences in parallel columns.

### Understanding short story, drama, novel, and poetry

- Have students map the basic characteristics of each genre.

### SAMPLE PRACTICE QUESTION

After reading the passage on "The Oak and the Reed," students are asked a number of questions including:

7. The style of this story is most like that of

   Ⓐ a fable

   Ⓑ a myth

   Ⓒ an epic

   Ⓓ a biography

**Comments:** Practice Test item 7 relates to standard R2.7 in that it asks students to recognize that the passage is a fable. While this item doesn't ask specifically about the four genres, it does relate to them.

## PERFORMANCE STANDARD: R2.8a

Students can define and identify plots, settings and characters in fiction.

### Understanding plots, setting, and characters

- Select three or four stories that have lots of information about different characters in relation to different settings, then:
  1. Divide the class into small groups and assign one story to each group. Instruct students to read with attention to details because they are going to be asked to serve as witnesses to the events in the story for a follow-up activity.
  2. When students have finished reading their stories, announce to the class that the main character in each story has been reported to the police as a missing person. The students who read a particular story will be interviewed as witnesses by a team of their classmates in the role of police detectives assigned to figure out what might have caused that story character's disappearance.
  3. Form detective teams of one or more students from each of the other story groups. Have these teams brainstorm lists of questions to ask the "witnesses" who read the stories about the "missing" characters.
  4. Have individual "detectives" use the lists of questions to interview individual "witnesses" over the next few days. Then have the detective teams meet, compare notes, and write reports of their investigations, including findings and conclusions.
  5. Finally, have detective teams read the story that involved the characters they investigated and compare their perceptions based on the witness interviews with what they gathered from the actual story and character.
- Have students explore the similarities and differences in the plots of a detective series on television. Have them discuss how the characters solved their problems on various shows.

### SAMPLE PRACTICE QUESTION

After reading the passage on "The Oak and the Reed," students are asked a number of questions including:

11. This passage takes place

Ⓐ in a field

Ⓑ on a prairie

Ⓒ at a beach

Ⓓ on a river

**Comments:** Practice Test item 11 relates to standard R2.8a by asking students to identify the setting of the passage. Item 5 also relates to this standard because Coda's barking is an important part of the plot and also provides insight into her character traits.

## PERFORMANCE STANDARD: R2.8b

Students can compare and contrast plots, settings, and characters in a variety of works by a variety of authors.

### Comparing and contrasting plots, settings, and characters

- Have students read a variety of books, and as the year goes on compare the works of the various authors and their books. Make a chart to compare and contrast such features as plots, settings, and characters.

## PERFORMANCE STANDARD: R2.9a

Students can differentiate between fact and opinion.

### Differentiating between fact and opinion

- Local controversies are exciting and relevant for many students. Exploit the opportunities that local newspapers provide. Have students collect different articles on the same controversy and discuss the points of view expressed.
- Have students write five sentences from a story that give true facts and five that show the author's opinion. Have them state next to each, what cues in the story helped them distinguish factual statements from opinion.
- Look at advertising promotions for opinions and facts. Have students bring to class products that they feel live up to their ads. Have the class look for discrepancies in the advertising as well as truths.

### SAMPLE PRACTICE QUESTION

After reading the passage on "Snowboarding," students are asked a number of questions including:

4. Which of the following statements shows the narrator's opinion?

Ⓐ I had no doubt that my uncle would find me.

Ⓑ My family moved from Bennington, Vermont to Lake Tahoe, California.

Ⓒ I looked beside me expecting to see him, but all I saw was whiteness.

Ⓓ After he had been with us a month, my uncle announced that he was going to teach me to snowboard.

**Comments:** Practice Test item 4 relates to standard R2.9a because it asks the student to identify an opinion held by the main character and narrator of the passage.

## PERFORMANCE STANDARD: R2.9b

Students can express opinions about a text and support these opinions with textual evidence.

### Expressing and supporting opinions

- Introduce students to the Socratic seminar format and give them text to prepare for the event. Hold seminars monthly.

## PERFORMANCE STANDARD: R2.10

Students can identify themes in texts and connect them to personal experiences, experiences of others, and other texts.

### Identifying themes and making connections

- When studying primary sources such as journals or diaries, have students write about how they would have reacted in the same situations. Use diary entries from different historical eras to discuss the similarities and differences of the times and how that affected what happened.
- Have students create a Venn diagram comparing an experience they have had with experiences the character in a book they are reading had.

## SAMPLE PRACTICE QUESTION

After reading the passage on "Snowboarding," students are asked a number of questions including:

1. This story is mostly about

   Ⓐ a child's relationship with his family

   Ⓑ a child whose dog saves him from a snowboarding accident

   Ⓒ a child who realizes that snowboarding is dangerous

   Ⓓ a lonely child who moves to a new place and goes to a new school

**Comments:** Practice Test item 1 relates to standard R2.10 because it asks students to identify the theme of the passage by selecting what the story is "mostly about."

## PERFORMANCE STANDARD: R2.11

Students can connect cultural events, ideas, settings, and influences from one text to similar texts from other cultures.

### Understanding cultural connections and influences

- Study different cultures and the common threads between them. Look at art, literature, music, and have students relate them to their lives. Look at transportation, homes, food, and religion. A great beginning is *Material World, a Global Family Portrait* by Peter Menzel.

# PART TWO
## Writing

## WHAT THE WRITING TEST WILL BE LIKE

The Writing Test of the Grade 6 Alaska Benchmark Examination will assess students' ability to:

- write compositions for different audiences, using a variety of forms;
- revise writing to improve logical progression and supporting information; and
- proofread and correct grammar, spelling, capitalization, punctuation, and sentence and paragraph construction.

## TYPES OF QUESTIONS

The Writing Test will include:

- about 30 multiple-choice questions in which students will be asked to select the best answer from a list of three or four possible answers;
- about five short "constructed-response" questions that will ask students to write a sentence, phrase, or paragraph, or to edit a writing sample;
- one extended "constructed-response" question that will ask students to produce a longer response to a prompt.

The Writing Test will include a "Writing Skills Checklist" reminding students to check their written responses for such things as writing with a beginning, middle, and end; supporting their writing with details; and writing using complete sentences, correct spelling and grammar, and careful word choice.

## SCORING

Students' answers to multiple-choice questions in the Writing Test will be scored according to an answer key. Correct answers will receive one point; incorrect answers will receive no points.

Students' answers to short and extended "constructed-response" questions will be scored by raters who read each written answer and use 4-point and 6-point rubrics to determine how many points to award each answer. *(You can see the rubrics in the scoring guide at the end of the Writing Practice Test in Appendix 2 of this guide.)*

## REPORTING STUDENTS'

Each student's scores for the Writing Test will provide three kinds of information:

- an overall score
- one of four proficiency ratings:
  - advanced
  - proficient
  - below proficient
  - not proficient
- and information about how well the student scored on each of the writing standards assessed by the test.

*(For more information about proficiency levels and how student scores relate to performance standards, see the Proficiency Descriptors in Appendix 3 at the back of this guide.)*

## TIME AND MATERIALS REQUIRED

Students may take as long as they need to complete the Writing Test, but most students should be able to finish in two to three hours. All necessary materials will be provided. Students are not allowed to use dictionaries, thesauruses, or other reference materials during the test, except in some cases, as in accom-

modations for students with disabilities. *(See* Participation Guidelines for the Inclusion of Special Education and LEP Students in State Assessments *under* "Student Testing" *on the Department of Education & Early Development web site* (www.eed.state.ak.us )).

# PREPARING STUDENTS
## to Meet Specific Standards in Writing

This section describes activities that teachers can use to help their students meet each of the Writing Performance Standards for students ages 8-10 (tested on the Grade 6 Benchmark Examination). Suggested activities are keyed to specific performance standards, which are spelled out in the lefthand column adjacent to them.

This section also includes sample test items from the Writing Practice Test for Grade 6, and some explanations of how specific test items relate to specific performance standards.

*(The Alaska Writing Performance Standards for students at all age levels can be found in Appendix 1 at the back of this guide; on the Department of Education & Early Development web site –* www.eed.state.ak.us *under "Standards for Student Learning"; and in the booklet* Standards for Alaska Students, *Alaska Department of Education & Early Development, February 1999.)*

*(The complete Writing Practice Test and Scoring Guides for the Grade 6 Benchmark Exam can be found in Appendix 2.)*

## PURPOSE

Proficiency in writing expands as students use their knowledge of the conventions of writing to express their ideas in a variety of fiction and non-fiction forms. As students develop this proficiency, they grow in their ability to:

- write well-organized compositions of two or more paragraphs,
- write using a variety of simple and complex sentence constructions,
- edit and proofread their own work and that of others, and
- revise their work to improve the quality and effectiveness of their writing.

# SUGGESTED ACTIVITIES

### PERFORMANCE STANDARD: W2.1

Students can write a well organized two-paragraph composition that addresses a single topic.

**Writing a composition**

- Each of the steps of the writing process should be taught in individual lessons over an extended period of time.
- Have students write an essay to persuade parents that children should be allowed to eat dessert first, stay up as late as they want, etc., or to persuade teachers that students should have longer recesses, no homework, or the option to chew gum, wear caps, etc., in class.
- Have students write about a situation reflected in a photo.
- Teach students to practice reviewing their work for good sentence structure, paragraph structure, and mechanics. With the authors' permission, copy selected pieces of student work onto overhead transparencies, then practice editing and proofreading as a whole-class activity. Discuss suggested changes.
- Have students write a review of a book or movie.

### SAMPLE PRACTICE QUESTION

18. Think about your best friend or someone you would like to have as a best friend. On the lines below, write a paragraph describing him or her. Explain how this person acts, what he or she looks like, what he or she likes to do, and why he or she is your best friend or could be your best friend. You do not have to use all the lines.

☑ For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

_____

_____

_____ *[More lines provided]* _____

**Comments:** Practice Test item 18 relates to standard W2.1 because it asks students to write a paragraph on a single topic. Items 1 and 8 also relate to this standard. They ask students to determine the best location for a given sentence in a paragraph, which reflects the emphasis on organization in this standard.

## PERFORMANCE STANDARD: W2.2

Students can use a variety of fiction and non-fiction forms when writing for different audiences.

### Using a variety of forms for different audiences

- Have students write fairy tales with or for younger students.
- Have students write journal entries, taking on roles as pioneers traveling west, characters from a novel, historical figures, or people from countries they are learning about in social studies.
- Have students keep science learning logs and lab notebooks. Assign each student a small section of the playground (for example, one square foot) to observe and record information about every week during the course of the year.
- Have students write a play and perform it with a group.
- Have them write letters to each other, taking on the roles of characters from a book.
- Have them write letters as if they were historical figures.
- Have students conduct interviews and write articles in news format.
- Have them write daily announcements or a news program for the school.
- Have students write descriptions and create illustrations for a book on local plants.

### SAMPLE PRACTICE QUESTION

11. Imagine that you are walking home from school one day and you find a treasure map. On the lines below and on the next pages, write a story about what you have to do to find the hidden treasure, what the treasure turns out to be, and what happens after you find it. You do not have to use all the lines.

☑ For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

★ Use the **Writing Skills Checklist** below
- to help you plan your writing
- to check your writing when you are done

**Writing Skills Checklist**

1. Have you written a story that is supported with details, has well-developed paragraphs, and has a beginning, a middle, and an end?
2. Have you written a story that will make sense to the person who reads it?
3. Have you written complete sentences?
4. Have you used correct grammar?
5. Have you used correct capitalization and punctuation?
6. Have you spelled all the words correctly?
7. Have you written your story clearly so that anyone can read your writing?

*[More lines provided]*

**Comments:** Practice Test item 11 relates to standard W2.2 because it asks students to write a form of fiction.

## PERFORMANCE STANDARD: W2.3a

Students can use a variety of simple and complex sentence structures in written work.

### Using a variety of sentence structures

- Read poetry with students and analyze phrases, simple and complex thoughts, and how they are represented in simple and complex sentences.
- Have students write different forms of poetry.
- Have students write for a variety of purposes such as newspaper articles, journal writing, and song lyrics to give them opportunities to practice different types of sentence structure.
- Encourage students to practice good sentence structure when they speak.
- Have students help create a list of transitional words and phrases and keep it posted in the classroom. *(For this reason, on the other hand, meanwhile, consequently...)*
- Help students focus on the common sentence errors—run-ons, fragments, and misplaced modifiers—during their daily editing and when proofreading as individuals or in small groups.
- Model and encourage students to use sentence combining to improve the effectiveness of their writing. "Morning Messages" to the class can be used to provide practice. Write a message on the board using simple, choppy sentences. Have students rewrite the message, combining sentences. This activity can also be used to provide practice with other proofreading and revising skills such as those in standard W2.3b, below.

### SAMPLE PRACTICE QUESTION

4. Choose the best way to write Sentence 4.

Ⓐ Rabbits are born blind, have no fur and cannot move around.

Ⓑ Rabbits are born blind, have no fur, and cannot move around.

Ⓒ Rabbits are born, blind, have no fur and cannot move around.

Ⓓ Best as it is: Rabbits are born blind have no fur and cannot move around.

**Comments:** Practice Test item 4 relates to Standard W2.3a because it requires students to select the best way to write a complex sentence. Items 3, 5, and 7 are similar in format to item 4 and also assess a student's ability to select a properly constructed sentence. Item 10 also addresses this standard, as it asks students to use their knowledge of how simple sentences are combined to form more interesting and effective complex sentences.

## PERFORMANCE STANDARD: W2.3b

Students can proofread and correct grammar, sentence structure, paragraph structure, punctuation, capitalization, spelling, and usage in finished written work.

### Proofreading

- Post a chart of the standard editing symbols and teach students how to use it. *(A chart of standard proofreading symbols and terminology can be found at (http://webster.commnet.edu/writing/symbols.htm))*
- Have students proofread and review each other's writing frequently.
- Hold student/teacher conferences to proofread and review drafts.
- Have students wait 24 hours before reading through a rough draft for the first time.
- Teach students how to proofread using a set, methodical approach such as reading the piece backwards word by word to check for spelling errors, having someone else read the piece aloud to the author, and using fingers to "frame" each sentence and check for subject and predicate.
- Provide students with copies of the Writing Skills Checklist *(See the Writing Practice Test for Grade 6).* Share and discuss the scoring guides from the Practice Test booklet. As a class activity, help students use this information to create class scoring guides for their writing.
- Provide mini-lessons and opportunities for practice in areas identified as problematic. *(A good source of materials can be found at (http://ccc.commnet.edu/grammar/index2.stm))*

### SAMPLE PRACTICE QUESTION

2. Choose the best way to write Sentence 1.

Ⓐ Wondered what makes a rabbit different from a hare?

Ⓑ Wondering what makes a rabbit different from a hare, have you?

Ⓒ Have you ever wondered what makes a rabbit different from a hare?

Ⓓ Best as it is: Have you ever wonder what makes a rabbit different from a hare?

**Comments:** Practice Test item 2 relates to standard W2.3b because it asks students to look at a sentence written by someone else and choose the correct form for that sentence. Items 3, 4, and 5 are similar in format and also address identifying errors and making revisions to sentence structure and punctuation.

## PERFORMANCE STANDARD: W2.4a

Students can revise writing to improve the logical progression of ideas and supporting information.

### Revising writing for logical progression of ideas and supporting information

- Have students wait 24 hours before reading a rough draft through for the first time.
- Have students review a rough draft by listening as a partner reads it aloud, checking to make sure the writing says what was intended, if elements are in the most effective order, if anything was left out, or if something not necessary was included.
- Have students prepare to defend a position in a forum by writing key facts on sentence strips (cash register tape) or note cards, then rearranging the facts until they are in the most effective order. This technique also works well for students who have difficulty sorting information into paragraphs for written reports.

### SAMPLE PRACTICE QUESTION

After reading the passage from Jill's science report, students are asked a number of questions including:

1. Where would this sentence best fit in the paragraph?

*Hares are born with their eyes open, have a soft covering of fur, and can move around easily just a few hours after birth.*

Ⓐ after Sentence 1

Ⓑ after Sentence 2

Ⓒ after Sentence 4

Ⓓ after Sentence 5

**Comments:** Practice Test item 1 relates to standard W2.4a because it asks students to determine where in a paragraph to place a sentence in order to maintain the logical progression of ideas. Item 8 is similar in format and also addresses this standard.

## PERFORMANCE STANDARD: W2.4b

Students can revise their own and others' work and provide appropriate feedback to peers based on established criteria, to improve the quality and effectiveness of writing.

### Revising to improve quality and effectiveness

- Teach guided lessons on the writing process, including practice with prewriting, drafting, peer editing, revising, rewriting, and publishing. Use these lessons to write a class story or report.
- Have writing groups in which a student is both writer and critic. This activity is patterned after authors' circles or writers' guilds. Provide opportunities for students to observe this activity, with a teacher in the lead, before undertaking it on their own. Here is one approach to this activity:

1. The student author reads one piece or part of a piece of writing.
2. Three responders each write down a word or feeling that impressed them.
3. The author reads the piece again.
4. This time the responders note other words or impressions they respond to.
5. Responders each then tell the author what they liked or found powerful about the writing and/or what they didn't understand or that seemed out of place.
6. The author thanks the responders.
7. The next author then reads his or her piece.
8. Important features in this format are teaching students to use phrases such as "I like your use of...," "Your writing was powerful when/because...," and "I didn't understand what you meant by...."

## SAMPLE PRACTICE QUESTION

14. A student wrote a report on memorization. There are six mistakes in grammar, punctuation, capitalization, and spelling. Draw a line through each mistake and write the correction in the space above it.

Did you know that people have two types of Memory. Short-term memory keeps a fact for just about as long as a person is actively thinks about it. Long-term memory holds onto complicated information for years or longer. Short-term and long-term memory is stored in different physical part of the brain.

With practice, anyone can remember things more easily. One of the easiest ways to remember something is to make the information rhyme. Another way is to make a mental picture of something, seeing it clearly in you're mind.

**Comments:** Practice Test item 14 is related to standard W2.4b because it requires students to find and correct errors in a short report written by someone else. Items 1 through 10 also require students to use their knowledge of punctuation, capitalization, grammar, and sentence structure to identify corrections to errors in writing produced by someone else. Students are also encouraged to proofread and correct their own written production in items 11 and 18, using the checklist provided.

## PERFORMANCE STANDARD: W2.5

Students can give credit for others' ideas, images, and information by citing information about sources, including title and author.

### Giving credit for ideas, images, and information

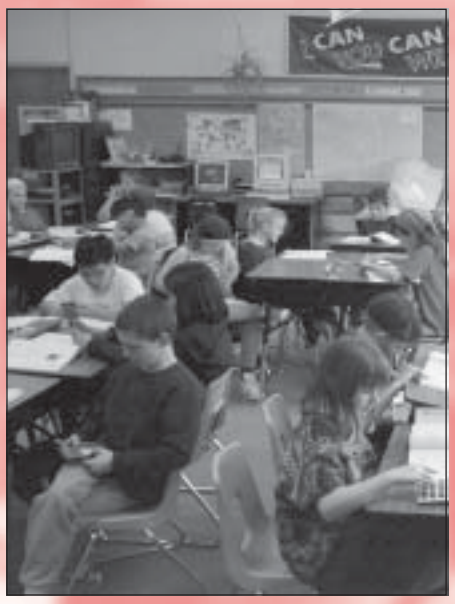
- Teach standard formats for citing works by others. Find out if your district or secondary schools require use of a particular format. If not, librarians and secondary English teachers are good sources of information about formats that can be used.

## PERFORMANCE STANDARD: W2.6

Students can use resources such as computers, word processing software, dictionaries, and thesauruses to make choices when writing.

### Using resources such as computers, dictionaries, and thesauruses

It is important that students have many opportunities to use these resources and to understand the purpose of each.




# PART THREE
## Mathematics

## WHAT THE MATHEMATICS TEST WILL BE LIKE

The Mathematics Test of the Grade 6 Alaska Benchmark Examination will assess students' ability to:

- use numbers to measure, estimate, and compute;
- understand mathematical functions and relationships;
- use basic statistics and probability theory;
- use mathematics to reason, solve problems, and communicate; and
- use geometry to solve problems involving points, lines, angles, surfaces and solids.

## TYPES OF QUESTIONS

The Mathematics Test will include:

- about 30 multiple-choice questions in which students will be asked to select the best answer from a list of three or four possible answers;
- about five short "constructed-response" questions that will ask students to respond to various tasks by writing their final answers in words or numbers, completing a graph, showing their work, or explaining how they got their answers;
- one extended "constructed-response" question asking students to show a considerable amount of their work, or supply detailed justification for answers to a multi-step problem.

## HOW TEST QUESTIONS RELATE TO KEY ELEMENTS OF THE MATHEMATICS STANDARDS

There are five Alaska Content Standards for Mathematics *(These are spelled out on the Department of Education & Early Development web site* (www.eed.state.ak.us) *under* "Standards for Student Learning"; *and in the booklet* Standards for Alaska Students, *under* "Alaska Content Standards—Mathematics," *Alaska Department of Education & Early Development, February 1999).*

The first mathematics content standard (Standard A) is: "A student should understand mathematical facts, concepts, principles, and theories." Standard A describes six key elements that encompass the six basic "strands" of content in mathematics. They include:

A1—Numeration
A2—Measurement
A3—Estimation and Computation
A4—Functions and Relationships
A5—Geometry, and
A6—Statistics and Probability.

Content standards B through E describe "process" skills and abilities. They include: B) Problem-solving, C) Communication, D) Reasoning, and E) Connections.

Performance standards for students are grouped under the six key elements encompassed in Mathematics Content Standard A and the four "process" skills encompassed in Content Standards B through E. *(These can also be found on the Department of Education & Early Development web site and in the booklet* Standards for Alaska Students.) There are 47 specific performance standards in mathematics for students ages 8-10; however, in many instances, student performance can be assessed on more than one of these standards at a time.

For example, there are seven specific performance standards under the Numeration strand. Questions that assess students on each of those seven performance standards have been grouped together on the Mathematics Test to form

a single measurement of how well students understand numeration. Similarly, questions assessing students on each of the seven performance standards under Geometry have been grouped together to form a single measurement of how well students understand geometry.

The same is true of questions measuring the other four key elements—Measurement, Estimation and Computation, Functions and Relationships, and Statistics and Probability. In fact, some questions assess more than one key element—requiring students to use functions and relationships, for example, at the same time they use estimation and computation. There are many crossovers.

There are also no test questions that are specific only to the "process" standards B through E, Problem-solving, Communication, Reasoning, and Connections. Students are assessed on these standards in the same questions used to assess their performance on the six key elements. For example, some questions may assess students' problem-solving while using geometry. Some may assess students' reasoning with questions involving functions and relationships, or probability and statistics.

## SCORING

Students' answers to multiple-choice questions on the Mathematics Test will be scored according to an answer key. Correct answers will receive one point; incorrect answers will receive no points.

Students' answers to short and extended "constructed-response" questions will be rated on the basis of scoring guides specific to the question being asked. *(See examples in the scoring guides following the Mathematics Practice Test in Appendix 2 of this guide.)*

## REPORTING STUDENTS' SCORES

Each student's report of results from the Mathematics Test will contain:

- an overall score
- one of four proficiency ratings:
  - advanced
  - proficient
  - below proficient
  - not proficient
- detailed information about performance for each of the six key elements and the four "process" standards. The report will not include information about student results on each of the performance standards within each content strand or "process" standard because there are too few test questions addressing each specific performance standard.

Scores from questions that measure both a content strand standard and a "process" standard will be used twice, once in the score for the content strand and again in the score for the "process" standard to which the question applies.

*(For more information about proficiency levels and how student scores relate to performance standards, see the Proficiency Descriptors in Appendix 3 at the back of this guide.)*

## RESOURCES PROVIDED WITH THE TEST

All necessary materials will be provided as part of the test. Students are not allowed to use calculators, except in some cases, as in accommodations for students with disabilities. *(See* Participation Guidelines for the Inclusion of Special Education and LEP Students in State Assessments *under* "Student Testing" *on the Department of Education & Early Development web site* (www.eed.state.ak.us))

## TIME ALLOWED FOR THE TEST

Students may take as long as they need to complete the Mathematics Test, but most students should be able to finish in two to three hours.

# PREPARING STUDENTS
## to Meet Specific Standards in Mathematics

This section describes activities that teachers can use to help their students meet each of the Mathematics Performance Standards for students ages 8-10 (tested on the Grade 6 Benchmark Examination). Suggested activities are keyed to specific performance standards, which are spelled out in the lefthand column adjacent to them.

This section also includes sample test items from the Mathematics Practice Test for Grade 6, and some explanations of how specific test items relate to specific performance standards.

*(The Alaska Mathematics Performance Standards for students at all age levels can be found in Appendix 1 at the back of this guide; on the Department of Education & Early Development web site* (www.eed.state.ak.us) *under "Standards for Student Learning"; and in the booklet* Standards for Alaska Students, *Alaska Department of Education & Early Development, February 1999.)*

*(The complete Mathematics Practice Test and Scoring Guides for the Grade 6 Benchmark Exam can be found in Appendix 2.)*

## KEY ELEMENT 1. Numeration

### PURPOSE

The ability to make sense of numbers is fundamental to understanding number magnitude and the effects of arithmetic operations. A student with a deep understanding of numeration will:

- represent numbers in a variety of ways,
- be aware of the relationship between numbers,
- interpret and use numbers in real world counting and measurement situations,
- predict with some accuracy the results of an operation,
- choose appropriate measurement units,
- choose the most appropriate representation of a number for a given circumstance, and
- recognize when operations have been correctly performed.

## SUGGESTED ACTIVITIES

### PERFORMANCE STANDARD: A1.2.1

Students can read, write, model, order, and count with integers to 1,000,000.

**Working with integers to 1,000,000**

- Estimate and measure different lengths and widths. Order from least to greatest.
- Compare elevations of geographic features. Use charts, graphs, and number lines.
- Read and compare numbers found in newspaper articles, advertisements, and almanacs.
- Find missing numbers on number lines with various scales.
- Compare and order numbers using tide tables and thermometers.
- Use a piece of string to estimate and measure the circumference of pumpkins. Measure length of string with a ruler. Order the measures from least to greatest.
- Use rulers as number lines.
- Use time lines.

## PERFORMANCE STANDARD: A1.2.2

Students can use, model, and identify place value positions from 0.001 to 1,000,000.

### Working with place value from 0.001 to 1,000,000

- Use place value charts, bundles of straws, beans & cups, and base 10 blocks to model place value.
- Use rounding to order large and small numbers found in populations, geographic areas, distances, and money.
- Model place value with respect to money and metric measurement.
- Display place value chart for a reference. Have students create their own charts for reference.
- Read *How Much is a Million?*
- Have students explain orally or in writing the difference between two place values.

**SAMPLE PRACTICE QUESTION**

6. What is the place value position of the 2 in the number 726,309.54?
   - Ⓐ thousands
   - Ⓑ ten thousands
   - Ⓒ hundred thousands
   - Ⓓ millions

**Comments:** Practice Test item 6 relates to standard A1.2.2 by having students identify the place value.

## PERFORMANCE STANDARD: A1.2.3

Students can model and explain the processes of multiplication and division. They can describe the relationships among the four basic operations.

### Understanding multiplication and division

- Use manipulatives to build area models for multiplication and division that reflect real world problems.
- Use many ways to show understanding of operations (for example, model multiplication and division problems using arrays, base 10 blocks, clustering numbers, combining dice, and playing card games.) Have students justify and explain results.
- Explain and verify relationship between operations.

## PERFORMANCE STANDARD: A1.2.4

Students can identify and describe different uses for the same numerical representation (for example: $^1/_2 = 0.5$, $^3/_4 = 75\%$).

### Describing different uses for the same number

- Do simple probability experiments.
- Convert linear measurements within the same system (for example: 15 in. = 1 ft. 3 in.)

## PERFORMANCE STANDARD: A1.2.5

Students can model and explain the process of adding and subtracting fractions with common denominators and decimals that represent money.

### Adding and subtracting fractions with common denominators, and adding and subtracting money

- After measuring each student's foot in inches, find the combination of students' feet that will most closely approximate 10 feet.
- Simulate a shopping spree involving adding and subtracting money and finding unit prices.
- Use fraction bar kits (Family Math).

- Use Ellison die cut fractions.
- Represent fractions with food (graham crackers, M&M's®).
- Use pattern blocks.
- Increase and decrease recipes.
- Include fractions when conducting linear measure exercises.
- Make a model to compare fractions.
- Use pictorial, concrete, and symbolic representations of fractions.
- Conduct a survey and display results in a circle graph.

## PERFORMANCE STANDARD: A1.2.6

Students can identify and describe factors and multiples including those factors and multiples common to a pair or set of numbers.

### Using factors and multiples

- Using a rectangular area such as a playground, find all possible whole number dimensions of the rectangle. Discuss possible fence lengths for the playground.
- Find missing numbers in "find my rule" patterns that use multiples.
- Have students rewrite a multiplication problem using the commutative property.

### SAMPLE PRACTICE QUESTION

1. Which number is a multiple of 6?

Ⓐ 16
Ⓑ 28
Ⓒ 42
Ⓓ 56

**Comments:** Practice Test item 1 relates to standard A1.2.6 by having students identify a multiple of 6.

## PERFORMANCE STANDARD: A1.2.7

Students can demonstrate the commutative and identity properties of multiplication.

### Understanding commutative and identity properties of multiplication

- Use rectangular arrays (3 x 4 and 4 x 3).
- Use patterns to discover identity property (3 x 1, 1 x 4, 5 x 1, ...).
- Use identity property to find equivalent fractions ($\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$).

### SAMPLE PRACTICE QUESTION

2. What number should be placed in the ☐ to make the number sentence true?

$4 \times 3 \times 2 = \square \times 2 \times 4$

Ⓐ 1
Ⓑ 2
Ⓒ 3
Ⓓ 4

**Comments:** Practice Test item 2 relates to standard A1.2.7 by having students recognize that multiplying numbers in any order results in the same product.

# KEY ELEMENT 2. Measurement

## PURPOSE

The ability to understand measurement is important because measurement pervades many aspects of everyday life and applies to other aspects of mathematics. An understanding of measurement aids students in collecting data and in describing and quantifying their world. A student with a deep understanding of measurement will:

- recognize the measurable attributes of an object,
- use formulas as well as measuring tools to measure attributes,
- know how changing an object's attributes may or may not affect the measurement of other attributes,
- be facile with standard and nonstandard units,
- make wise choices of units or scales depending on the problem situation, and
- know that all measurements are approximations.

# SUGGESTED ACTIVITIES

## PERFORMANCE STANDARD: A2.2.1

Students can estimate and measure weights, lengths, and temperatures to the nearest unit using the metric and standard systems.

### Estimating and measuring to the nearest unit

- Have students estimate and measure things found in their environment such as: amount of catsup used at the school; distance from home to school; temperature of water in puddles, ponds, snow, sea, rivers, and tap water; heights of students in the class; or the area of the classroom floor, desks, seats, books, or chalkboards.
- Use string to measure circumference of circles.
- Use square tiles or transparent grid paper to approximate area.
- Compare volume by filling objects with beans, then counting the number of beans used.
- Estimate the length of the room by measuring one floor tile and counting the number of tiles.

## SAMPLE PRACTICE QUESTION

7. Julie used her ruler to measure the pencil below. She used 2 different units of measurement.

Which of these could be the 2 different units of measurement that Julie used?

Ⓐ 120 millimeters and 12 centimeters

Ⓑ 12 millimeters and 120 centimeters

Ⓒ 120 centimeters and 12 meters

Ⓓ 12 centimeters and 120 meters

**NOTE:** The length measurements may not be exact because of differences in printers.

**Comments:** Practice Test item 7 relates to standard A2.2.1 by having students estimate and measure the length of the pencil. It also relates to standard A2.2.2 by having students use the equivalent measure that 10 millimeters equals one centimeter.

## PERFORMANCE STANDARD: A2.2.2

Students can identify and use equivalent measurements (for example,
60 minutes = 1 hour
7 days = 1 week
1 ft. = 12 inches
4 qts. = 1 gal.)

### Using equivalent measures

- Have students measure the same item in both feet and yards, or inches and yards, or centimeters and meters, or quarts and cups, etc.
- Use equivalent measure charts in cookbooks to increase or decrease recipes.
- Convert recipe measures to a single unit (for example, use only tablespoon or cup measures for an entire recipe).
- Use a set of blueprints and convert all measures to yards or inches.

### SAMPLE PRACTICE QUESTION

5. Mr. Brower wants to buy enough string to hang his students' art projects. Mr. Brower wants to hang 30 art projects. He will use 6 inches of string for each project. What is the *least* amount of string, in feet, he should buy?

   Ⓐ 5 feet
   Ⓑ 15 feet
   Ⓒ 60 feet
   Ⓓ 180 feet

**Comments:** Practice Test item 5 relates to standard A2.2.2 by having students use the equivalent measure 12 inches equals one foot. In addition, students must be able to multiply and divide whole numbers (standard A3.2.4).

## PERFORMANCE STANDARD: A2.2.3

Students can use a variety of measuring tools; they can describe the attribute(s) they measure.

### Using measuring tools

- Build something following a plan.
- Cook something following a recipe.
- Sew something following a pattern.
- Have students identify tools to measure length, volume, weight, angles, or temperature.

## PERFORMANCE STANDARD: A2.2.4

Students can estimate and measure the dimensions of geometric figures.

### Estimating and measuring dimensions

- Have students measure and record dimensions and area of various rectangles. Create a chart and look for patterns. Have students generate a rule, then challenge them to consider why it works for small as well as large rectangles.
- Have students find surface area of towers of cubes of various heights. Have them chart and investigate the change in surface area as the towers increase in height.

## PERFORMANCE STANDARD: A2.2.5

Students can tell time using analog and digital clocks identifying AM and PM; they can find elapsed time.

### Telling time and identifying AM and PM

- Graph daylight hours.
- Create and follow a daily schedule.
- Chart time spent on activities such as exercising, sleeping, eating, doing homework, reading, watching television, using the computer, etc.
- Study time zones by simulating telephone calls to various places around the world.

- Use tide tables to study elapsed time.
- Study airline schedules and create an itinerary for a trip. Determine amount of time spent on various legs of the trip.
- Determine start and stop times for cooking.

**PERFORMANCE STANDARD: A2.2.6**

Students can read, write, and use money notation, determining possible combinations of coins and bills to equal given amounts; they can count back change for any given situation.

### Making change

- Set up a class store, bake sale, or class "garage" sale. Have students count back change.
- Play games such as Monopoly®.

# KEY ELEMENT 3. Estimation and Computation

## PURPOSE

Number sense and understanding of the meanings of arithmetic operations grow deeper as students encounter a range of representations and problem situations. A student with a deep understanding of estimation and computation will:

- solve problems involving whole-number computation, money, and fractions with common denominators,
- solve many problems mentally,
- estimate a reasonable result,
- efficiently recall or derive basic number facts,
- compute fluently (efficiently and accurately) with multi-digit whole numbers, and
- understand the equivalence of commonly used fractions and decimals.

# SUGGESTED ACTIVITIES

**PERFORMANCE STANDARD: A3.2.1**

Students can describe and use a variety of estimation strategies including rounding to the appropriate place value, multiplying by powers of 10, and using front-end estimation to check the reasonableness of solutions.

### Using estimation strategies to determine reasonableness

- Simulate situations where students apply estimation strategies (for example, check the balance remaining on a check book register while you shop, estimate the total cost of items while you are shopping, estimate the total cost of a new car when accessories are added).
- Have students consistently estimate to determine the reasonableness of their answers.

### SAMPLE PRACTICE QUESTION

13. Lori entered a 20-kilometer race. A kilometer is about $\frac{5}{8}$ of a mile. About how many miles long is the race?

Ⓐ 8 miles
Ⓑ $12\frac{1}{2}$ miles
Ⓒ $20\frac{5}{8}$ miles
Ⓓ 32 miles

**Comments:** Practice Test item 13 relates to standard A3.2.1 by having students use rounding to estimate a solution. Students recognize that $\frac{5}{8}$ is slightly more than $\frac{1}{2}$, so each kilometer is a little over $\frac{1}{2}$ mile; therefore, 20 kilometers is a little over 10 miles.

## PERFORMANCE STANDARD: A3.2.2

Students can recall and use basic multiplication and division facts orally, with paper and pencil without a calculator.

### Recalling and using basic multiplication and division facts

- Use flash cards, timed tests, multiplication songs, and games such as "Round the World."

## PERFORMANCE STANDARD: A3.2.3

Students can add and subtract whole numbers and fractions with common denominators to 12, and decimals, including money amounts, using models and algorithms.

### Adding and subtracting using models and algorithms

- Use fraction bars, array models, number line models, egg cartons, base 10 blocks, and paper folding to model operations with whole numbers, fractions, and decimals.
- Have students share and discuss various algorithms and strategies for estimation and computation.

### SAMPLE PRACTICE QUESTION

3. The recipe for Tommy's famous chocolate chip cookies calls for $\frac{3}{4}$ cup of chocolate chips. Tommy wants to triple the recipe.
What is $\frac{3}{4} + \frac{3}{4} + \frac{3}{4}$ ?

Ⓐ $1\frac{1}{2}$
Ⓑ 2
Ⓒ $2\frac{1}{4}$
Ⓓ 3

**Comments:** Practice Test item 3 relates to standard A3.2.3 by having students add fractions with common denominators. Furthermore, students need to convert between fractions and mixed numbers (standard A3.2.5).

## PERFORMANCE STANDARD: A3.2.4

Students can multiply and divide multi-digit whole numbers by 2-digit numbers, limiting the 2-digit divisors to those that end in 0; they can multiply and divide decimals that represent money by whole numbers.

### Multiplying and dividing

- Provide meaningful context for multiplication and division practice.
- Give students a unit cost and ask them to purchase specific quantities. Give them the total cost of an order and ask them to find unit cost.

### SAMPLE PRACTICE QUESTION

10. Alan wants to bring 12 cupcakes to his class party. He can buy cupcakes at the bakeries listed below:

    - Sunrise Bakery sells 3 cupcakes for $1.80
    - Quality Bakery sells 4 cupcakes for $2.20
    - Tasty Bakery sells 6 cupcakes for $3.00

    To spend the least amount of money, Alan needs to know how much one cupcake costs at *each* bakery. What is the cost per cupcake at *each* bakery? Show your work and write your answers in the box below.

    Cost per cupcake at Sunrise Bakery: $ _____

    Cost per cupcake at Quality Bakery: $ _____

    Cost per cupcake at Tasty Bakery: $ _____

**Comments:** Practice Test item 10 relates to standard A3.2.4 by having students divide decimals that represent money by whole numbers. Because this is an extended response question, students must show their division work. Practice Test item 14 also relates to A3.2.4 by having students multiply decimals that represent money by whole numbers. For Practice Test Item 5 students must be able to multiply and divide whole numbers (standard A3.2.4) as well as using the equivalent measure 12 inches equals one foot.

## PERFORMANCE STANDARD: A3.2.5

Students can find equivalent fractions. They can convert between fractions and mixed numbers.

### Using fractions and mixed numbers

- Use fraction bars and pattern blocks to model equivalent fractions.
- Use a ruler to convert between equivalent fractions and between fractions and mixed numbers.
- Find equivalent fractions using the identity property (see standard A1.2.7).

## PERFORMANCE STANDARD: A3.2.6

Students can develop and interpret scales and scale models.

### Interpreting and using scale drawings

- Using a scale on a map, estimate the distance between landmarks.
- Begin with a picture and create a grid on it, then on larger scaled grid paper draw an enlargement of the original.

### SAMPLE PRACTICE QUESTION

16. Rachel has to draw two rectangles that are similar to each other. She drew the first rectangle 5 centimeters wide and 6 centimeters long. She drew the second rectangle 10 centimeters wide. How long should she draw the length of the second rectangle?

    Ⓐ 11 centimeters

    Ⓑ 12 centimeters

    Ⓒ 15 centimeters

    Ⓓ 20 centimeters

**Comments:** Practice Test item 16 relates to standard A3.2.6 because students must understand the scale factor being used. It also relates to standard A5.2.3 because students must identify similar shapes by giving a missing dimension.

# KEY ELEMENT 4. Functions and Relationships

## PURPOSE

Students make sense of the world around them by organizing information and expressing it in a variety of ways. A student with a deep understanding of functions and relationships will:

- identify and build numerical and geometric patterns,
- describe patterns verbally and represent them with tables or symbols,
- look for and apply relationships between varying quantities to make predictions,
- make and explain generalizations that seem to always work in particular situations,
- use graphs to describe patterns and make predictions, and
- use standard and nonstandard symbols and variables to express a pattern, generalization, or situation.

# SUGGESTED ACTIVITIES

## PERFORMANCE STANDARD: A4.2.1

Students can use patterns and their extensions to make predictions and solve problems; they can describe patterns found in the number system, including those formed by multiples, factors, perfect squares, and powers of 10.

### Using and describing patterns

- Use 10's table (10 by 10 multiplication table) or 12's table (12 by 12 multiplication table) to explore multiplication patterns (that is, shade multiples of 6 on the 12's table). Also look for patterns on the 100's chart.
- Have groups of students use counters to mark multiples of 2, 3, 4, 5, 6, and so on. Have groups investigate and discuss patterns and write a description of their findings.
- Organize information: Using a 2 x 2 grid have students tell how many rectangles they see. One strategy to solve this problem is to organize the information into a table, identifying the different rectangles by area. Do a similar activity on a 4 x 4 geoboard.

## SAMPLE PRACTICE QUESTION

8. What is the next number in the pattern below?

12, 19, 26, 33, ...

Ⓐ 26

Ⓑ 33

Ⓒ 39

Ⓓ 40

**Comments:** Practice Test item 8 relates to standard A4.2.1 by having students extend a given pattern.

## PERFORMANCE STANDARD: A4.2.2

Students can generate and solve simple functions by identifying and applying multiplication and division patterns.

### Using multiplication and division patterns to solve simple functions

- Play "What's my rule?" and "In and out function machines."
- Build patterns with tiles, beans, etc., recording results and finding the rule (for example, triangular numbers, square numbers, an "L" shape).

## PERFORMANCE STANDARD: A4.2.3

Students can use a calculator to find a missing item in a number sequence.

### Finding a missing number in a sequence using a calculator

- Find the missing number: 2, 12, 72, 432, ____.
- Find the missing number: 1, 4, 9, 16, 25, ____, 49.

## PERFORMANCE STANDARD: A4.2.4

Students can use words, lists, and tables to represent and analyze patterns.

### Representing and analyzing patterns

- Use circle designs: Have students complete a table with multiples of a number. Have them highlight the ones digit of the multiples until they notice the pattern repeats. Draw equally spaced points on a circle labeled 0 through 9. Connect the points on the circle according to the numbers in the repeating pattern.
- Build tables to represent costs (for example, one item costs $2, two items cost $4, etc.)
- Using tables from real life situations, analyze the patterns and describe them in words or symbols (shipping costs, halibut girth & weight, etc.).

## PERFORMANCE STANDARD: A4.2.5

Students can explain the purpose of variables and use them in open sentences to express relationships and describe simple functions (for example: $5 + \_\_ = 2 + 6$ or $x + 2 > 10$).

### Using variables in open sentences

- Have students use related sentences: Given a number sentence write two related sentences (for example: If $8 - 2 = n$ then $n + 2 = 8$ and $8 - n = 2$)
- Play "Number Magic," giving students a sequence of steps to follow such as: "Choose any number. Multiply by 6. Add 12. Take half. Subtract 6. Divide by 3. Write your answer." Have students work through the example and challenge them to explain why they always end with the same number with which they started. Use manipulatives such as raisins and boxes of raisins to represent the numbers and variables, respectively. Guide the students in seeing that each arithmetic operation done to their original number (the box) was undone in some successive step. Represent steps with pictures and symbols. (See *NCTM Addenda series, Grades K-6: Patterns,* p 42-44; or *Fifth Grade Book,* p 5-7)

### SAMPLE PRACTICE QUESTION

9. Mary has some trading cards. Julie has 3 times as many trading cards as Mary. They have 36 trading cards in all. Which of these equations represents their trading card collection?

   Ⓐ $3x = 36$

   Ⓑ $x + 3 = 36$

   Ⓒ $x + 3x = 36$

   Ⓓ $3x + 36 = x$

**Comments:** Practice Test item 9 relates to standard A4.2.5 by having students recognize an open sentence that describes a given situation. Practice Test item 11 also relates to standard A4.2.5 by having students use a variable in an open sentence.

# KEY ELEMENT 5. Geometry

### PURPOSE

Geometry is a place where students develop reasoning and justification skills as well as the modeling and spatial reasoning needed to describe their physical environment and solve problems. A student with a deep understanding of geometry will:

- use clarity and precision in describing the properties of geometric objects and then classifying the objects,
- know how shapes are related to one another and use the properties to justify these relationships,
- describe the effects of transformations, and
- make and use coordinate systems to specify locations.

# SUGGESTED ACTIVITIES

### PERFORMANCE STANDARD: A5.2.1

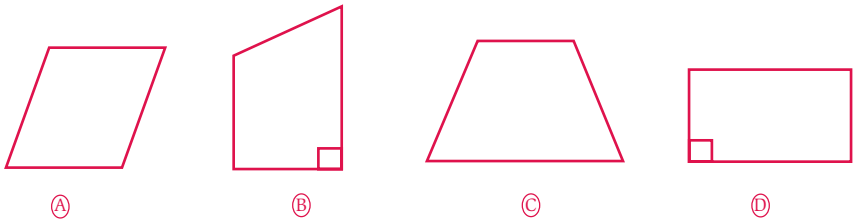
Students can identify and compare various triangles and quadrilaterals according to their sides and/or angles.

#### Identifying triangles and quadrilaterals

- Identify right angles: Have children use paper folded twice to make a square corner, then have them use their square corners to find objects in the classroom that contain a square corner and those that have angles that measure less than or more than a square corner. Have students draw angles less than or greater than right angles and "almost" right angles. Have them use their square corner to investigate which solid shapes (cubes, pyramids, and prisms) have right angles.
- Have students use geoboards to construct figures according to directions that include properties of triangles and quadrilaterals such as: "Create a quadrilateral that has two pairs of parallel sides and no right angles."
- Solve shape riddles such as: "I have four sides and one pair of parallel sides and no right angles. What am I?"
- Identify various quadrilaterals and triangles found in the community (signs, buildings, art, packages, nature . . .).

## SAMPLE PRACTICE QUESTION

17. Which of the figures below is a quadrilateral with 2 pairs of parallel sides and no right angles?




**Comments:** Practice Test item 17 relates to standard A5.2.1 by having students identify quadrilaterals according to sides and angles.

## PERFORMANCE STANDARD: A5.2.2

Students can compare and contrast plane and solid figures (for example, circle/sphere, square/cube, triangle/pyramid) using relevant attributes, including the number of vertices, edges, and the number and shape of faces.

### Comparing plane and solid figures

- Use Venn diagrams to compare attributes of plane and solid figures.
- Have students bring representations of cubes, prisms, cylinders, etc. to class.
- Use manipulatives, such as sets of Polydrons™, to compare and contrast solid figures.
- Explore shadow images of three dimensional shapes.

## PERFORMANCE STANDARD: A5.2.3

Students can identify and model geometric figures that are congruent, similar, and/or symmetrical.

### Identifying and modeling congruent, similar, and symmetrical shapes

- Create tiling patterns with congruent shapes.
- Design tessellations, or mosaics, using manipulatives, computer software, and various types of paper with grids or dots.
- Identify symmetry in letters, two-dimensional figures, the human body, mirror reflections, and drawings.

**Comments:** Practice test item 16 relates to standard A5.2.3 by having students identify similar shapes by giving a missing dimension. Students also must understand the scale factor being used (standard A3.2.6).

## PERFORMANCE STANDARD: A5.2.4

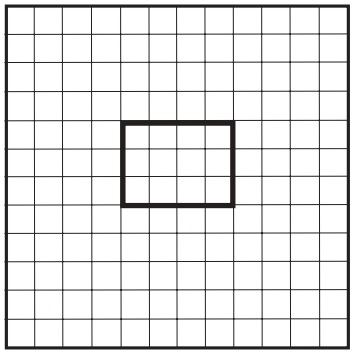
Students can distinguish between area and perimeter; they can find both using a variety of methods including rulers, grid paper, and tiles.

### Finding area and perimeter

- Have students draw shapes that have the same perimeter on grid paper, such as 18, then have them cut out the shapes and order them with respect to area from least to greatest.
- Use the activity above, keeping the area the same and ordering with respect to perimeter.
- Find perimeter and area of shapes in the room.
- Create a design with pattern blocks and find its area and perimeter.

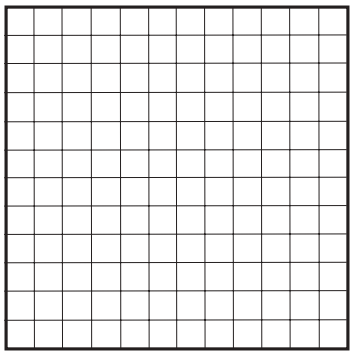
## SAMPLE PRACTICE QUESTION

15. What is the area, in square units, of the rectangle drawn on the grid below?



Answer: _____ square units

On the grid below, draw a rectangle that has an area of 10 square units.



**Comments:** Practice Test item 15 relates to standard A5.2.4 by having students find and demonstrate area using grid paper.

## PERFORMANCE STANDARD: A5.2.5

Students can identify and model transformation of geometric figures, describing the motions as slides, flips, or rotations.

### Identifying and modeling transformation of geometric figures

- Create tessellations, or mosaics, using printmaking and computer drawing programs for wallpaper, quilts, floor tiles, stamps, etc.
- Have students make two triangles by cutting a square along its diagonal. Have them rearrange the triangles to make other shapes, then explore the types of movement needed when relocating the triangles. Repeat with a rectangle and compare results.

## PERFORMANCE STANDARD: A5.2.6

Students can locate and describe objects in terms of their position with and without compass directions; they can identify coordinates for a given point or locate points of given coordinates on a grid.

### Using directions to locate points

- Play Battleship®.
- Make mini-archeological sites in boxes. Students must create a coordinate grid to document where artifacts are discovered.
- Have students design treasure maps and give directions to the treasure based on a coordinate grid. Have students exchange maps and follow directions to the treasure.

### PERFORMANCE STANDARD: A5.2.7

Students can sketch and identify line segments, midpoints, intersections, and parallel and perpendicular lines.

**Knowing the meaning of line segment, midpoint, intersection, parallel, perpendicular**

- Draw pictures and design shapes on geoboards with criteria that include terminology from this performance standard.
- Have students identify terminology from this performance standard in objects in the room.

# KEY ELEMENT 6. Statistics and Probability

## PURPOSE

The skills necessary to becoming informed citizens and intelligent consumers include an ability to reason statistically. These skills involve data analysis and aspects of probability. A student with a deep understanding of statistics and probability will:

- collect, organize, and represent sets of data,
- use representational tools such as tables, line plots, bar and line graphs,
- use measures of center and spread such as median, mode, and range, and
- analyze information to make informed choices.

# SUGGESTED ACTIVITIES

### PERFORMANCE STANDARD: A6.2.1

Students can collect, organize, and display data creating a variety of visual displays including tables, charts, and line graphs.

**Collecting, organizing and displaying data**

- **Survey:** Have students discuss possible activities that would answer the question "How do you think fifth-grade students in our school spend their time?" Have small groups of students each design a questionnaire for one day of the week, then have the groups conduct a pilot study or field test of their design. Use these results to have the class develop a common questionnaire. Each group of students will survey 10 students. Students decide how they will determine which 10 they will survey in order to have a representative sample. Random numbers may be used to select a sample from a numbered list of students. Obtain random numbers by using a spinner, computer program, or numbers in a hat. Have students derive a composite description of the activities of each of the days of the week.
- **Observe:** Have students observe: What kinds of food are thrown away in our lunch room? Have them decide: How many days of the week will be observed? How many garbage cans will they look through? Will they watch or go through the garbage cans? Will they take a sample or count all the food for a day or for many days? How will categories of food be determined?
- **Measure:** Have students examine the variables that may change the distance a marble rolls after leaving a tube. Place one end of a tube against a vertical ruler and the other end on the floor. Drop the marble through the tube. Measure the distance the marble rolls and the height of the tube. Gather data for various tube heights. Discuss the variables involved such as length of tube, size of marble, floor covering. Design experiments to measure their effects.

## PERFORMANCE STANDARD: A6.2.2

Students can present data using a variety of appropriate representations and explain the meaning of the data.

### Presenting and explaining data

- Using graphs or charts from newspapers and magazines, have students work in pairs to answer a set of generic questions such as: Where did the graph/chart come from? What do the numbers represent? What is the largest/smallest number? What does that number tell you? Who might be interested in this information and why? Have each pair of students select three different types of displays such as table, line or bar graph, pictograph, etc. to use when answering the questions. Ask students to analyze graphs that might be poorly presented such those with no labels or those without consistent scales. Discuss how this might lead to confusion.
- Using charts and numerical data found in newspapers and magazines, ask students to rewrite the articles and create graphs to better convey the message.
- Ask students to analyze a survey described in an article. Who was surveyed? How many people were involved? Who sponsored the survey? When was the survey given? What questions were asked?

### SAMPLE PRACTICE QUESTION

12. Ms. Nonell's sixth-grade class is going on a fishing trip. The pictograph below shows the number of fish caught each day.

**FISH CAUGHT ON FISHING TRIP**

| Day | Number of Fish |
|---|---|
| Monday | |
| Tuesday | |
| Wednesday | |
| Thursday | |

| Key |
|---|
| = 5 fish |

According to the information in the pictograph, how many fish were caught on Thursday?

Ⓐ 3

Ⓑ 4

Ⓒ 15

Ⓓ 20

**Comments:** Practice Test item 12 relates to standard A6.2.2 by having students explain the meaning of the data display.

## PERFORMANCE STANDARD: A6.2.3

Students can describe and interpret a data set using mean, median, mode, and range.

### Using mean, median, mode, and range to describe data

- Record the heights of plants grown in each of two classrooms. Compare plant height data from the two different classes looking at distribution displayed in a variety of ways such as a frequency chart or line plot. Compare median, mode, and range, discussing variations between the two classrooms.
- Give each student a box of raisins asking each one to guess the number of raisins without opening the box. Find the range of guesses. Have students open their boxes and, without pouring them out, estimate the number of raisins in the box. Plot the estimates in a stem and leaf or line plot. Count the raisins in each box and plot the results. Put students in small groups. Have each group determine the mean number of raisins for their group, plot the mean, and compare that to the guesses and estimates. Calculate the actual mean for the class. Is the mean a good guess for the number of raisins in the box?

## SAMPLE PRACTICE QUESTION

18. The table below shows the scores 14 students received on a math test.

**MATH SCORES**

| Score | Tally |
|---|---|
| 100 | 𝍸 |
| 95 | 𝍸 |
| 90 | \|\| |
| 85 | \| |
| 80 | \|\|\| |

What is the median score?

Ⓐ 85

Ⓑ 90

Ⓒ 95

Ⓓ 100

**Comments:** Practice Test item 18 relates to standard A6.2.3 by having students interpret a data set using median.

## PERFORMANCE STANDARD: A6.2.4

There is no performance standard on this topic for students ages 8-10.

## PERFORMANCE STANDARD: A6.2.5

Students can estimate whether a game is mathematically fair or unfair; they can analyze and present probability data using simple fractions.

### Presenting and analyzing probability

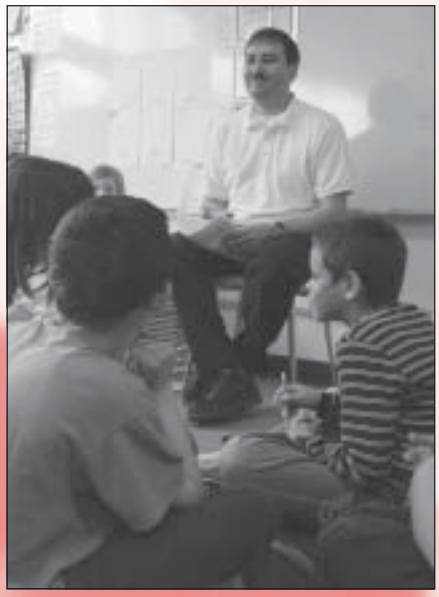
- Use a sack of 10 checkers, some black and some red. Two teams alternate turns and use a number line from 0 to 10. The starting point is 0. Before play begins, determine which team will move forward when a black is drawn and which will move with red. The first team to reach 10 is the winner. Have teams predict whether it was a fair game and why. Check the contents of the bag to determine whether the game was fair. Have students write the probability to win with either red or black using fractions.

## PERFORMANCE STANDARD: A6.2.6

Students can conduct simple probability experiments using concrete materials and represent the results using fractions and probability.

### Conducting simple probability experiments

- Cut a hole slightly smaller than the size of a craft bead in the lid of an opaque bottle. Secretly place 10 beads of two colors in the bottle (for example three red and seven blue). Two teams of students alternate turns; each team uses a number line from 0 to 10. The starting point is 5. On each turn, the team decides whether red or blue will indicate movement toward 10. The members of each team take turns shaking the bottle upside down until one bead falls out. If the bead is of the color predicted, the team moves forward one space. If not, it moves back one space. The first team to reach either 0 or 10 wins. Children should be encouraged to keep a record of the colors that appear for later analysis and discussion. At the conclusion of the game, each team guesses the number of beads of each color and writes the probability that would represent. The first team to identify correctly the number of each color gets to change the distribution of the two colors in the bottle for the next round.



# PART FOUR

## Glossaries and Resources for Teachers

# GLOSSARY—READING & WRITING

**affix** | a morpheme, or meaningful linguistic unit, that changes the meaning or function of a root or stem to which it is attached. In the word *adjoining,* for example, there are two affixes: the prefix *ad-* and the suffix *–ing.*

**alphabetic principle** | the assumption underlying alphabetic writing systems that each speech sound or phoneme of a language should have its own distinctive graphic representation

**assertion** | a declaration or positive statement of belief or opinion

**cite** | to quote as an authority; to give credit to those whose ideas or quotations are used in one's written or oral communications

**composition** | a short essay, usually produced as a school assignment

**comprehension** | as related to reading, the act of grasping the meaning of printed text. Involves understanding the literal meaning (*literal comprehension*), interpreting the suggested meaning (*inferential comprehension*), and evaluating what is read.

**context clues** | information from the immediate textual setting that helps identify a word. Used to help decode words being read for the first time; to resolve ambiguity (Does the word *duck* in this sentence mean an animal or the act of bending over?); and to confirm the accuracy of decoding (Does this word or group of words make sense and does it sound right?). When used with words that are already known, context clues help resolve which shade of meaning is intended in a particular situation (Is the word *progress* used as a noun or a verb?).

**conventions** | sets of rules or accepted practices in spoken or written language; commonly used to refer to spelling, punctuation, capitalization in writing

**description** | one of the four traditional forms of composition in speech and writing; meant to give a verbal picture of characters and events, including the setting in which they occur

**discourse** | a conversation; the act or result of making a formal written or spoken presentation on a subject, as in learned discourse or literacy; in linguistics, any form of oral or written communication more extensive than a sentence

**edit** | to revise or correct a manuscript. Generally used in the writing process to refer to correction of the mechanical features of writing such as spelling, punctuation, capitalization, etc., as part of the production of final drafts or preparation for publication. There are other levels of editing that focus on such qualities as organization, factual accuracy, consistency of tone, etc. (See *revise.)*

**exposition** | one of the four traditional forms of composition in speech and writing; intended to set forth or explain. Good exposition is clear in conception, well organized, and understandable. It may include limited amounts of argumentation, description, and narration to achieve this purpose.

**expressive writing** | highly personal writing, as in diaries, personal letters, autobiographies, etc.

**fluency** | the clear, easy expression of ideas in writing or speaking; freedom from problems or awkwardness that might hinder comprehension in silent reading or the expression of ideas in oral reading

**four modes** | the traditional forms of composition in speech and writing: exposition, narration, persuasion, and description (See definitions under each of these terms.)

**genre** | an established category of literature defined by its style, form, and/or content; short story, novel, drama, or poetry, for example

**grammar** | the system of rules that is generally accepted by a language community; includes inflection, word order, the structural aspects of sentences, and usage

**high frequency words** | words that appear many more times than most other words in spoken or written language. Basic word lists generally provide words ranked by their frequency of occurrence as calculated from a sample of written or spoken text suitable for the level of intended use.

**infer** | as related to inferential comprehension, to interpret meaning beyond the literal level of the text; to "read between the lines" and reach a conclusion or understanding based on evidence provided in the text

**literal** | as related to literal comprehension, meaning explicitly stated in the text

**main idea** | the gist of a passage; its central thought

**narration** (narrative) | one of the four traditional forms of composition in speech and writing; tells a story or gives an account of something, dealing with sequences of events and experiences, though not necessarily in strict order

**persuasion** (persuasive writing) | one of the four traditional forms of composition in speech and writing; meant to move the reader to a belief or proposition by using argument or entreaty

**phoneme** | a minimal sound unit of speech that, when contrasted with another phoneme, distinguishes words in a language. For example, *b* in *book* contrasts with *t* in *took*, *c* in *cook*, *h* in hook.

**phonics** | a system of teaching reading and spelling that stresses basic symbol-sound relationships and their application in decoding words; used especially in beginning instruction

**phonemic awareness** | awareness of the sounds (*phonemes*) that make up spoken words. Such awareness does not appear when young children learn to talk; it is not necessary for speaking and understanding spoken language. However, phonemic awareness is important for learning to read. In alphabetic languages, letters (and letter clusters) represent phonemes, and in order to learn the correspondences between letters and sounds, one must have some understanding of the notion that words are made up of phonemes.

**phonetics** | the study of speech sounds and their transcription into written form

**point of view** | the perspective from which an author tells his or her story. An author using an omniscient point of view knows and tells all, usually through the voice of a narrator. An author using a more restricted point of view may tell the story through, and from the perspective of, only one character.

**prefix** | an affix attached to the beginning of a word, such as *dis* in *discontinue*

**pre-writing** | the initial creative stage of writing, prior to drafting, in which the writer formulates ideas, gathers information, and considers ways to organize the writing

**prior knowledge** | knowledge that stems from previous experience. Prior knowledge is a key component of schema theories of reading comprehension.

**readers' theater** | performance of a story, play, or poetry in which one or more readers take the parts of characters and read rather than act out the parts, much like a radio play

**revise** | to make structural or content changes to a manuscript in order to improve clarity and effectiveness

**root word** | the meaningful base form of a complex word after all affixes are removed. A root may be independent (able to stand alone), like *read* in *unreadable*, or it may be dependent (unable to stand alone), like *-liter-* (from the Greek for *letter*) in *illiterate*.

**semantics** | the study of language that focuses on the meanings of words, phrases, sentences, paragraphs, and whole pieces of writing

**sentences** (three basic kinds) |
**declarative** makes a statement
**exclamatory** makes a vehement statement or conveys strong or sudden emotion
**interrogative** asks a question or makes an inquiry

**sight recognition** | the immediate recognition of a word as a whole (See *sight word*)

| | |
|---|---|
| **sight word** | a word that is immediately recognized as a whole and does not require word analysis for identification |
| **syntax** | the way in which words are put together to form phrases, clauses, or sentences |
| **suffix** | an affix at the end of a word, such as *ing* in *fixing* |
| **T chart** | a table that helps students organize their thinking by listing two things being compared in adjacent columns. When the name of one thing and its qualities are listed in one column, and the name of the other and its qualities are listed in an adjacent column, it becomes easy for students to see how the things are alike and different and to organize their writing accordingly. |
| **text** | a written or spoken piece in its entirety. Text also refers to the body of a piece, excluding headings, titles, etc., or to a textbook used in a school course. In this document, it is used to refer to any piece of literature, fiction or non-fiction. |
| **theme** | a topic of discussion or writing; a major idea or proposition broad enough to cover the entire scope of a literary or other work of art. A theme may be stated or implicit, but clues to it may be found in the ideas that are given special prominence or tend to recur in a work. |
| **thesis** | the basic argument advanced by a speaker or writer who then attempts to prove it; the subject or major argument of a speech or composition |
| **thesis statement** | a sentence that presents the central argument or main idea of a speech or composition |
| **tone** | the author's attitude as reflected in his or her writing style in a particular piece. Tone may be sarcastic, humorous, serious, playful, for example. |
| **topic** | a general category or class of ideas, often stated in a word or phrase, to which the ideas of a passage belong |
| **topic sentence** | a sentence that expresses the main idea in a paragraph or passage |
| **usage** | the usual, generally accepted way in which words and phrases are used within a given language community |
| **Venn diagram** | a graph or simple picture that uses overlapping circles to show relationships. Words, qualities, etc. may be placed inside separate circles or in the area(s) where circles overlap, showing what they do or do not have in common. |
| **voice** | a syntactic pattern that indicates the verb-subject relationship. The principal voices in English and many other languages are active (as in *He hit the ball.*) and passive (as in *The ball was hit.*). Also, an author's distinctive way of using language, tone, and other qualities. |
| **word family** | a group of words sharing the same root word or a common phonic element. *Television, telephone,* and *telepathy* are part of the *tele_* family. *Cat, hat,* and *mat* are part of the *_at* word family. |
| **word recognition** | the process of determining the pronunciation and some degree of meaning in a written word; the quick and easy identification of the form, pronunciation, and appropriate meaning of a word previously encountered in print or writing |

# RESOURCES—READING & WRITING

## PUBLICATIONS

(These publications were distributed to schools or are available from the Alaska Department of Education & Early Development.)

Alaska Department of Education & Early Development Reading Booklets:

1. *On the Threshold: How Your Child Develops Birth to Five Years*
2. *Opening the Door: What Families and Teachers Can Do to Help Every Child Become a Reader*
3. *Unlocking the Door: Current Research on How Children Learn to Read*

Alaska Department of Education & Early Development: *Language Arts Frameworks.* (This document is not current, but many of the classroom suggestions and resources are still quite useful and timely. It is also available on the EED web site at: http://www.eed.state.ak.us/tls/frameworks/langarts/1title.htm

*Building a Knowledge Base in Reading.* Jane Braunger and Jan Lewis, Northwest Regional Educational Laboratory: Portland, Oregon (1997).

*Guidelines for Teaching Middle and High School Students to Read and Write Well: Six Features of Effective Instruction.* Judith A. Langer, National Research Center on English Learning and Achievement: Albany, New York (2000).

*Title I Resource Guide: A collection of essential school improvement resources.* The Comprehensive Centers Network and The National Association of State Title I Directors.

## WEB SITES

**Alaska Department of Education and Early Development**
http://www.eed.state.ak.us

**International Reading Association**
http://www.reading.org

**National Council of Teachers of English**
http://www.ncte.org

**Alaska Native Curriculum and Teacher Development Project**
http://www.alaskool.org

**Alaska Native Knowledge Network**
http://www.ankn.uaf.edu

**Alaska State Literacy Association**
http://www.asd.k12.ak.us/depts/reading/index.htm

**Alaska State Writing Consortium**
http://pec.jun.alaska.edu/aswcpage.html

**LitSite Alaska**
http://litsite.alaska.edu

**Northwest Regional Educational Laboratory: 6 + 1 Traits Writing Page**
http://www.nwrel.org/eval/writing/

**Northwest Regional Educational Laboratory: Traits of an Effective Reader**
http://www.nwrel.org/eval/reading/

**WestEd Regional Educational Laboratory:**
**Strategic Literacy Initiative for Middle and Secondary Students**
http://www.WestEd.org/stratlit/ideas/ideas.shtml

**Proofreading Symbols and Terminology—**
**Capital Community College**
http://webster.commnet.edu/writing/symbols.htm

**Guide to Grammar & Writing—**
**Capital Community College**
http://ccc.commnet.edu/grammar/index2.stm

**Social Studies Teacher Resources—**
**University of Virginia, Curry School of Education**
http://curry.edschool.virginia.edu/teacherlink/social/resources

# GLOSSARY—MATHEMATICS

**absolute value** | the number of units a number is from zero on a number line

**abstract context** | a problem or statement without reference to a real-world application

**accuracy** | exactness; correctness

**acute angle** | an angle whose measure is between 0 degrees and 90 degrees

**algebraic expression** | a collection of variables (letters) and constants (numerals) that are combined using addition, subtraction, multiplication, division, and radicals or fractional exponents

**algebraically** | designating an expression, equation, or function in which numbers, letters, and arithmetic operations are contained or used

**algorithm** | a systematic procedure which, if followed, accomplishes a particular task

**associative** | An operation (*) is said to be associative if it does not matter where parentheses are placed when three elements are combined. For example, $(a * b) * c = a * (b * c)$ is true if * is associative.

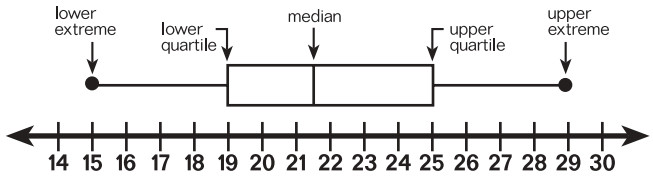
**attribute** | a distinctive feature or characteristic

**base system** | a place value system in which the base is a number that is raised to various powers to generate the principal counting units of the number system. For example, 123 in base 10 is $1 \times 10^2, + 2 \times 10^1 + 3 \times 10^0$. 123 in base 5 is $1 \times 5^2 + 2 \times 5^1 + 3 \times 5^0$.

**basic operations** | the operations of addition, subtraction, multiplication and division

**bisector** | something that divides a thing into two equal parts

**box and whisker plots** | graphs that show how far apart and how evenly data are distributed. For example:




**cardinal number** | a number, such as 3 or 11 or 412, used to indicate quantity but not order

**chart** | a presentation of information in the form of graphs or tables

**chord** | a line segment joining two points on a circle

**commutative** | The operation * on a set is commutative if $a * b = b * a$ for all members of a set

**compass directions** | geographical directions in reference to the earth, such as north, south, east, west

**compatible numbers** | pairs of numbers that work in combination with other numbers (for example, 219 divided by 69 is about 21 divided by 7)

**composite number** | a whole number, greater than 0, that has more than two whole number factors

**concrete representation** | a representation or statement presented in the context of a real world application (for example, a number sentence from a word problem)

**congruent** | having the same shape and size

**conservation of area** | keeping the area measure of a shape the same even though the shape changes dimensions

**coordinate geometry** | geometry in which conclusions are drawn based on information about figures located on a coordinate plane

**coordinate plane** | the plane formed by two perpendicular number lines called *axes*

**coordinates** | numbers in an *ordered pair;* that is, a pair of numbers that describes a point on a graph with reference to the $x$ (horizontal) and $y$ (vertical) axes

**counterexamples** | examples that prove a statement to be untrue

**curve fitting** | finding the equation of a curve that best describes a given set of points

**deductive reasoning** | the process of demonstrating that if certain statements (axioms, postulates, theorems) are accepted as true then other statements can be proved to follow from them. A good rule of thumb when thinking of deductive reasoning is to view it as applying *general* cases to prove a *specific* case.

**degree of accuracy** | a pre-specified level of exactness or correctness

**direct proof** | proof that a statement is true by the use of deductive reasoning

**distributive** | having the property that multiplying a sum by a number gives the same result as multiplying each addend by the number and then adding the products. For example:

$a(b + c) = a \times b + a \times c$ $\quad 3(4 + 5) = 3 \times 4 + 3 \times 5$

$3(a + b) = 3a + 3b$

**divisibility** | capability of being divided with no remainder (for example, the number 21 is divisible by 7)

**dodecahedron** | a solid shape with twelve faces. All the faces of a regular dodecahedron are regular pentagons.

**equation** | a mathematical sentence that uses an equals sign (=) to show that two quantities are equal

**equivalent fractions** | fractions that name the same number, such as 2/4 and 1/2

**equivalent representations** | equal numbers or expressions that are represented in different forms such as fractions, decimals, percents, scientific notation and exponents (for example: 1/2 = .5 = 50%)

**error** | the difference between an estimated solution and the exact solution

**Euclidean geometry** | geometry in which conclusions are drawn based on the propositions given by the Greek geometer Euclid around 250 B.C.

**even numbers** | numbers ending in 0 or 2 or 4 or 6 or 8; that is, numbers that are multiples of 2

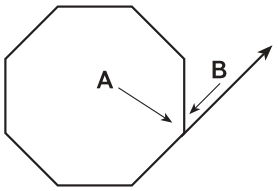
**experimental probability** | the probability associated with the outcome of an actual experiment; the ratio of the number of times an event occurs in an experiment to the total number of outcomes

**exponent** | the number that indicates how many times the base is used as a factor. For example, in the equation $2^3 = 2 \times 2 \times 2 = 8$, the exponent is 3, indicating that 2 is used as a factor three times

**exponential** | containing, describing, or involving an exponent

**expression** | a mathematical phrase that uses numbers, variables, and operation symbols to represent a value

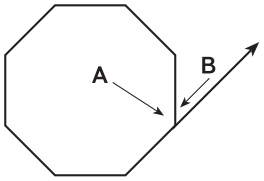
**exterior angle** | an angle that forms a linear pair with an interior angle of a polygon. For example, in the diagram below, angle B is an exterior angle




**factors** | numbers that divide exactly into another number; any of two or more whole numbers that are multiplied to form a product (for example, 1, 2, 4, and 8 are factors of 8)

| | |
|---|---|
| **Fibonacci Numbers** | numbers in the following sequence: 1, 1, 2, 3, 5, 8, 13, 21, . . . After the first two 1's, each number is the sum of the two immediately preceding it. |
| **finite graphs** | graphs on the coordinate plane having an upper and a lower boundary |
| **formula** | a rule that is expressed using variables, symbols and/or numbers (for example, $A = \pi r^2$ or $P = 2(L + W)$ |
| **Four** (or basic) **Operations** | the mathematical operations of addition, subtraction, multiplication, and division |
| **frequency distribution** | a set of intervals or increments, usually adjacent and of equal width, into which the range of a statistical distribution is divided; a table that pairs each item in a set of data with the number of times that item occurs |
| **front-end estimation** | a close calculation that involves rounding numbers to their highest place to arrive at an approximate value |
| **function** | a relationship between two quantities in which the value of one quantity is uniquely determined by the value of the other quantity. Each element in the domain *(input)* is matched with exactly one element of the range *(output).* |
| **geometric figure** | a shape having geometric properties such as length, width, area, etc. |
| **geometric model** | a representation of a real-world situation using geometric shapes |
| **geometric sequence** | an ordered list of numbers that has a common ratio between successive terms. Each successive term is formed by multiplying the preceding term by the common ratio (for example, 1, 3, 9, 27, . . . is a geometric sequence with a common ratio of 3) |
| **geometric shapes** | plane or solid figures having geometric properties |
| **graphic representations** | charts, diagrams, tables, graphs, or other pictorial representations of mathematical ideas |
| **graphically** | using a graphic representation to illustrate a mathematics problem |
| **guess and check** | a problem-solving strategy in which a guess is offered and then checked for accuracy |
| **histogram** | a representation of a frequency distribution by means of contiguous bars whose width represents equal intervals and whose height represents the frequency of data values (a bar graph, for example) |
| **identity** | the property by which adding 0 to any number results in a sum identical to the given number; and the property by which multiplying 1 by any number results in a product identical to the given number |
| **independent events** | events in which the outcome of one event is not affected by the outcome of another event. These are opposed to *dependent events,* in which the outcome of one event *is* affected by the outcome of another event. For example, drawing a card from a deck of cards and replacing it, then drawing a second card, are independent events. Drawing a card and not replacing it, and then drawing a second card, are dependent events. |
| **indirect measurements** | measurements determined by methods other than the use of measurement tools (for example, calculating a distance using the Pythagorean Theorem, similar figures, or trig ratios) |
| **indirect proof** | proof by contradiction |
| **inductive reasoning** | the process of observing data, recognizing patterns, and making generalizations from the observations. A good rule of thumb for remembering the process of induction is that one moves from *specific* cases to a *general* rule. |
| **inequality** | one quality not being equal to another. A mathematical sentence that shows the relationship between quantities that are not equal may use symbols such as $<$ , $>$ , $<$ , $>$ , $\neq$. |

**interior angle** — an angle formed within a polygon by the intersection of two sides. For example, in the diagram below, angle A is an interior angle.




**irregular polygon** — a multi-sided closed figure whose sides and angles are not congruent

**iteration** — the process of repeating the same procedure over and over again

**line of symmetry** — a line that divides a figure into two congruent parts

**linear** — relating to a function that has a constant rate of change and can be modeled by a straight line

**linear equation** — an equation whose graph is a line.

Examples: $y = x + 9$, $3x - 2y = 10$, $y = -4$

Counterexamples: $y = 3x^2 + 6$, $4xy = 12$, $1/y = 4x$

**manipulatives** — any of a wide variety of physical materials and objects that students may use to foster the learning of abstract ideas in math

**mathematical problem-solving strategies** — strategies used to solve problems (for example, drawing a picture, "guess and check," looking for a pattern, making an organized list, making a table or chart, solving a simpler problem, working backward, using manipulatives, acting it out)

**matrix** — a rectangular array of numbers (plural is *matrices*). Potential uses include spreadsheets, transformations, linear algebra.

**mean** — the arithmetic mean, or average; the sum of a set of $n$ numbers divided by $n$

**measure of center** — (in statistics) a single score that can best represent a whole set of data (for example, the mean, mode, or median of a data set)

**measuring tools** — tools used to measure length, capacity, weight, mass, degree, etc.

**median** — the value of the middle number in an ordered set of data, or the average of the two middle numbers in a set

**Metric System** — a system of measure whose basic units are: meter for length, liter for capacity, gram for mass, and degrees Celsius for temperature

**mode** — the "most popular" value, or the most frequently occurring item in a set of data

**model** — a representation of something in the real world that uses geometry, algebra, or other mathematics

**multiple** — the product of a number and a whole number (for example, multiples of 8 are 8, 16, 24, 32...)

**non-standard units** — measuring units that are not Metric or U.S. Customary System measuring units

**number sequence** — an ordered list of numbers

**number system** — a group of interacting, interrelated, or interdependent elements grouped together for classification or analysis. For example, the base 10 system.

**number theory** — the study of characteristics of numbers such as primes, composites, factors, multiples, etc.

**numeric** — expressed or counted by numbers

**numerical representation** — an expression that includes only numbers

**obtuse angle** | an angle whose measure is between 90 degrees and 180 degrees

**odd numbers** | numbers not divisible by 2. Odd numbers have 1, 3, 5, 7, or 9 in the ones' place

**one-to one correspondence** | the situation in which two sets of elements match, and each element from one set is paired with one and only one element from the other set

**open sentence** | a mathematical sentence in which at least one term is unknownk (for example, $3 + \_\_\_ = 5$, or $3 + a = 5$). An open sentence is neither true nor false.

**operation** | a way of combining elements in a set (for example, addition, subtraction, multiplication, division)

**order** | the arrangement of numbers in a sequence, such as smaller to larger, or larger to smaller

**order of operations** | the correct order of evaluating numerical expressions. First, do work in parentheses or brackets. Second, evaluate powers and roots. Third, do multiplication and division from left to right. Last, add and subtract from left to right.

**ordered pair** | a pair of numbers used to locate a point on the coordinate plane. The first number represents the position with reference to the *x*-axis (horizontal). The second number represents the position with reference to the *y*-axis (vertical).

**ordinal numbers** | numbers indicating position in a series or order. The ordinal numbers are *first, second, third, etc.*

**Pascal's Triangle** | a system of numbers triangularly arranged in rows that consist of the coefficients in the expansion of $(a + b)^n$ for $n = 0, 1, 2, 3, \ldots$

**pattern** | the arrangement of numbers, pictures, etc. in an organized and predictable way

**percent** | a ratio whose second term is 100 (for example, 20:100, $20/100 = 20$ percent, or 20%)

**perfect square** | a number whose square root is a whole number

**perpendicular** | intersecting to form a right angle

**pictograph** | a graph that uses pictures to show and compare information

**pictorial representation** | a drawing or picture that represents data

**place value** | the value of a digit in a number, written in standard notation, as determined by its position. In a base 10 system, each place has a value ten times that of the place to its right and one-tenth the value of the place to its left.

**plane figure** | a figure whose points all lie on the same plane

**polygon** | A closed plane figure whose sides consist of three or more segments in the same plane that intersect only at their endpoints

**polynomials** | algebraic expressions with more than one term

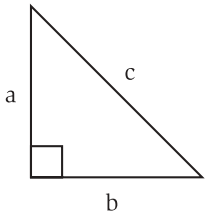
**power** | the number of times that a number is used as a factor (for example, 2 to the power 5 is $2 \times 2 \times 2 \times 2 \times 2$ and is written $2^5$)

**precision** | a property of measurement that is related to the unit of measure used. The smaller the unit of measure, the more *precise* the measurement is (for example, 27mm is more precise than 3 cm).

**prime number** | a number that has exactly two factors, itself and 1

**proportion** | an equation stating that two ratios are equal

**Pythagorean Theorem** | the proposition that for every right triangle, the sum of the areas of the squares on the legs equals the area of the square on the hypotenuse. In the diagram to the right, if $a$ and $b$ are the lengths of the legs, and $c$ is the length of the hypotenuse, then $a^2 + b^2 = c^2$.

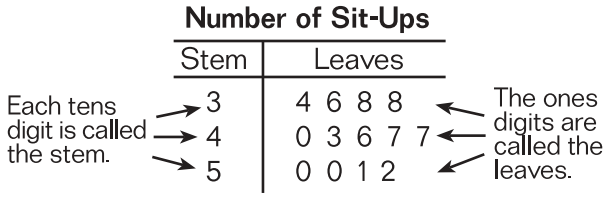


| | |
|---|---|
| **quadratic** | a function or equation involving a variable raised to the second power, and no higher power. The general form of a quadratic equation is: $ax^2 + bx + c = 0$, where $a$, $b$, and $c$ are real numbers and $a$ is not equal to 0. |
| **range** | (in statistics) the difference between the greatest and the least numbers in a set of data |
| **ratio** | a comparison of two numbers or quantities (for example, 5 to 7, 5:7, or 5/7) |
| **rational expression** | a polynomial or a quotient of polynomials |
| **rational number** | any number that can be expressed as a ratio $a/b$ when $a$ and $b$ are integers and $b \neq 0$. |
| **ray** | a part of a line that has one endpoint and extends endlessly in the other direction |
| **real numbers** | the set of numbers that includes all rational and irrational numbers |
| **rectangular prism** | a solid figure with parallel, congruent rectangular bases, and parallelograms as sides |
| **regular polygon** | a polygon that has all its sides the same length and all its angles the same size |
| **relationship** | a way of connecting sets of things, such as numbers or people |
| **right angle** | an angle with a measure of 90 degrees |
| **right triangle trigonometry** | the study of the relationship between angle measures and ratios of side lengths of right triangles. The common ratios are sine, cosine and tangent. |
| **root** | a number that when multiplied by itself an indicated number of times forms a product equal to a specified number. Also a solution to an equation. For example, $a$ is the xth root of $b$ if $a^x = b$. |
| **rounding** | the process of dropping digits to the right of the decimal point or removing non-zero digits to the left of the decimal point and replacing them with zeros |
| **sample group** | (in statistics) a representative portion of the population(s) from which information is gathered |
| **sample space** | a set of all the possible outcomes of an experiment |
| **scale** | a ratio that compares the dimensions of a model to the actual dimensions of an object |
| **scale drawing** | a drawing made so that all distances in the drawing are proportional to actual distances |
| **scatter plot** | a graph made by plotting points on a coordinate plane to show the relationship between two variables in a data set |
| **scientific notation** | the method of expressing a number as the product of a number from 1 up to, but not including, 10, and a power of 10 (for example, $483 = 4.83 \times 10^2$) |
| **secant** | a line that intersects a circle at two points |
| **sequence** | an ordered list of numbers |
| **sets of equations** | See *systems of equations* |
| **similar** | having the same shape but not necessarily the same size |
| **skip count** | to count by multiples (for example, 3, 6, 9, 12, . . .) |
| **slope of a line** | the measure of the steepness of a line; that is, the ratio of vertical change to horizontal change |
| **solid figure** | a three dimensional figure such as a sphere, a cube, or a pyramid, etc.) |
| **Standard System** | *(also known as the U.S. Customary System or U.S. System of measurement)* a system that measures length in inches, feet, yards, and miles; capacity in cups, pints, quarts, and gallons; weight in ounces, pounds, and tons; and temperature in degrees Fahrenheit |

**standard units** | U.S. Customary and/or Metric units of measure

**stem and leaf plot** | a method of organizing data from least to greatest using the digits of the greatest place value to group data

Example:




**subset** | If every element of a set B is also an element of the set A, then B is a subset of A.

**survey** | (in statistics) a study that collects data from human respondents. Surveys are used to find out about people's characteristics, behaviors, interests, etc.

**symbolic** | of, pertaining to, or expressed by a symbol or symbols

**symmetrical** | having a line of symmetry, or correspondence in size, shape, and relative position

**system of equations** | two or more linear equations used to determine a common solution

**systems** (of measurement) | Metric Measure and U.S. Customary Measure

**table** | an organized display of data using columns and rows to delineate categories of data

**tally** | a mark used to record a number of acts or objects, most often in a series of five, consisting of four vertical lines crossed diagonally or horizontally by a fifth line

**tangent** | a line intersecting a circle at only one point and perpendicular to the radius at that point

**tessellations** | repeating patterns of congruent plane figures that completely cover a plane with no gaps or overlapping (like a mosaic)

**tetrahedron** | a polyhedron with four triangular faces

**theoretical probability** | the ratio of the number of times an event could occur to total possible outcomes

**transformation** | a change in the size, shape, or position of a geometric figure (for example, a translation or slide, a reflection or flip, a rotation or turn, a dilation or enlargement or reduction)

**tree diagram** | a branching diagram that shows all possible outcomes of an experiment

**triangular prism** | a solid figure that has two parallel congruent triangular bases and parallelograms as sides

**truncating** | cutting a number off abruptly rather than rounding it

**unit of measure** | a precise quantity used to describe an attribute of an object. For example, inches, cm, feet, etc. are units of measure used to describe length. Quarts, gallons, liters are units of measure used to describe capacity.

**validity** | the state in which a conclusion is correctly derived from premises

**variable** | a letter or symbol used to represent one or more numbers in an expression, equation or inequality

**Venn diagram** | a graph or picture that uses circles to show relationships between sets by inclusion, exclusion, or intersection of the circles

**vertex** | a point where two or more rays or segments meet, where sides of a polygon meet, or where edges of a polyhedron meet (plural is *vertices*)

**whole numbers** | the set whose numbers are zero and the counting numbers (for example, the numbers 0, 1, 2, 3 and so on)

# RESOURCES—MATHEMATICS

## PUBLICATIONS

National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards, 1989.

NCTM Addenda Series 1992.
(Available by strand for grades K-12 and by grade level for grades K-6)

NCTM Principles and Standards for School Mathematics, 2000.

NCTM Navigations Series, 2001.

NCTM magazines/bulletins: Teaching Children Mathematics, Mathematics Teaching in the Middle School, Mathematics Teacher, Dialogues, News Bulletin, Student Math Notes.

Books by Marilyn Burns

Books and videos by Bill Nye

*Adding It Up: Helping Children Learn Mathematics,* National Academy Press, Washington, D.C., 2001.

## WEB SITES

http://www.eed.state.ak.us/tls/mathconsortium/home.html/
(Alaska Math Consortium)

http://www.nctm.org/ (National Council of Teachers of Mathematics)

http://www.illuminations.nctm.org

http://www.standards.nctm.org

http://forum.swarthmore.edu/ (Math Forum)

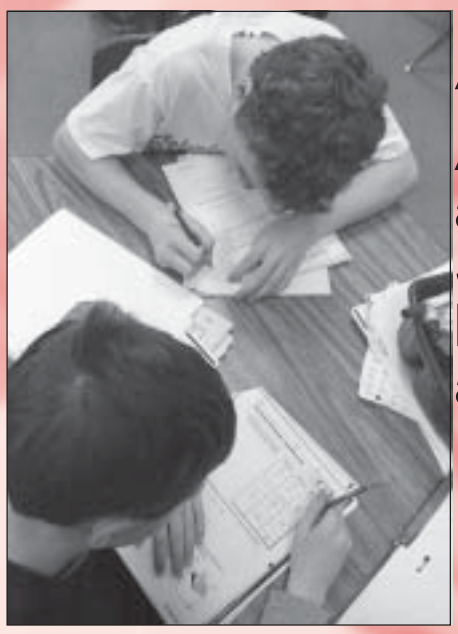
http://www.lhs.berkeley.edu/ (Lawrence Hall of Science)

## CATALOGS

Creative Publications

Dale Seymour Publications

Activity Resources Company



# APPENDIX 1

## Alaska Content and Performance Standards in Reading, Writing, and Mathematics

# ALASKA CONTENT STANDARDS for English/Language Arts

The **CONTENT STANDARDS FOR ALASKA STUDENTS** were adopted by the Alaska State Board of Education in 1994 and 1995. The **ALASKA READING PERFORMANCE STANDARDS** support the sections of the English/Language Arts Content Standards listed to the right of this column. The Benchmark Examinations and the High School Qualifying Examination will assess students' competencies on the performance standards.

These are the English/Language Arts content standards that relate to reading.

**B. A student should be a competent and thoughtful reader, listener, and viewer of literature, technical materials, and a variety of other information. A student who meets the content standard should:**

1. comprehend meaning from written text and oral and visual information by applying a variety of reading, listening, and viewing strategies; these strategies include phonic, context, and vocabulary cues in reading, critical viewing, and active listening;
2. reflect on, analyze, and evaluate a variety of oral, written, and visual information and experiences, including discussions, lectures, art, movies, television, technical materials, and literature; and,
3. relate what the student views, reads, and hears to practical purposes in the student's own life, to the world outside, and to other texts and experiences.

**D. A student should be able to think logically and reflectively in order to present and explain positions based on relevant and reliable information. A student who meets the content standard should:**

1. develop a position by
   a. reflecting on personal experience, prior knowledge, and new information;
   b. formulating and refining questions;
   c. identifying a variety of pertinent sources of information;
   d. analyzing and synthesizing information;
   e. determining an author's purposes; and
2. evaluate the validity, objectivity, reliability, and quality of information read, heard, and seen.

**E. A student should understand and respect the perspectives of others in order to communicate effectively. A student who meets the content standard should:**

1. use information, both oral and written, and literature of many types and cultures to understand self and others;
2. recognize content from the speaker's or author's perspective;
3. recognize bias in all forms of communication; and
4. recognize the communication styles of different cultures and the possible effects on others.

# ALASKA READING PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **R1.1a** Distinguish, reproduce, and manipulate the sounds in words.<br>**R1.1b** Use a combination of the following to read and comprehend text:<br>• knowledge of phonics, alphabet, and alphabetic principle, *e.g.* recognition of letter shapes, letter names, letter/sound relationships, initial/final consonants, vowels, letter patterns;<br>• pictures and visual cues;<br>• sight recognition of high frequency vocabulary words;<br>• word structure, *e.g.* root words, prefixes, suffixes, rhyming words;<br>• language structure, *e.g.,* word order, grammar;<br>• meaning structure, *e.g.,* prior knowledge and context;<br>• text structure *e.g.,* read left to right. | **R2.1a** Use a combination of the following to read and comprehend text:<br>• knowledge of phonetics, language structure, and semantics;<br>• text structures such as illustrations, graphs, and headers;<br>• self-monitoring and self-correcting strategies when reading;<br>• adjusting reading pace or style based on purpose, task, and type of text.<br>**R2.1b** Use knowledge of word families, phonetics, context clues, visual cues, and structural elements to determine meaning of unfamiliar words. | **R3.1** Apply knowledge of word origins, structure and context clues, and root words, and use dictionaries and glossaries, to determine the meaning of new words and to comprehend text. | **R4.1** Apply knowledge of syntax, roots, and word origins, and use context clues and reference materials, to determine the meaning of new words and to comprehend text. |
| **R1.2a** Comprehend literal meaning from text.<br>**R1.2b** Use a variety of strategies to support comprehension, including predicting, questioning, rereading, and monitoring own comprehension. | **R2.2** Infer meaning from text. | **R3.2** *This standard is assessed at an earlier level. It is related to R4.10 (understanding of theme).* | **R4.2** *This standard is assessed at an earlier level. It is related to R4.10 (understanding of theme).* |
| **R1.3** Read texts aloud with expression, demonstrating knowledge of punctuation and other conventions of print. | **R2.3** Read texts aloud with rhythm, flow, expression, demonstrating knowledge of punctuation and other conventions of print. | **R3.3** Rehearse and read texts aloud to an audience, in performances such as readers' theater, reading to younger students or peers, or as part of formal presentations including research reports and literature responses. | **R4.3** *Students are expected to master skills related to this standard in earlier grades.* |
| **R1.4a** Retell or dramatize a story after reading it.<br>**R1.4b** Restate information after reading a text. | **R2.4a** Retell stories in correct sequence.<br>**R2.4b** Restate and summarize information or ideas from a text. | **R3.4** Restate and summarize information or ideas from a text and connect new information or ideas to prior knowledge and experience. | **R4.4** Summarize information or ideas from a text and make connections between summarized information or sets of ideas and related topics or information. |
| **R1.5** Identify the main idea of a passage. | **R2.5** Locate evidence in the text and from related experiences to support understanding of a main idea. | **R3.5** Clarify and connect main ideas and concepts, identify their relationship to other sources and related topics, and provide supporting details. | **R4.5a** Identify and assess the validity, accuracy, and adequacy of evidence that supports an author's main ideas.<br>**R4.5b** Critique the power, logic, reasonableness, and audience appeal of arguments advanced in public documents. |

## ALASKA READING PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **R1.6** Read and follow simple directions to complete a simple task. | **R2.6** Read and follow multi-step directions to complete a simple task. | **R3.6** Read and follow multi-step directions to complete a task, and identify the sequence prescribed. | **R4.6** Read and follow multi-step directions to complete complex tasks. |
| **R1.7** Distinguish between common forms of text (genres):<br>• fiction and non-fiction<br>• prose and poetry, and<br>• short story and drama | **R2.7** Explain the characteristics of the following:<br>• fiction and non-fiction,<br>• prose and poetry, and<br>• four major genres of fiction: short story, drama, novel, and poetry. | **R3.7** Analyze basic rules (conventions) of the four genres of fiction (short story, drama, novel and poetry). | **R4.7** Analyze the rules (conventions) of the four genres of fiction (short story, drama, novel, and poetry) and the techniques used in these genres, and evaluate the effects of these conventions and techniques on the audience. |
| **R1.8** Identify and describe basic plot, main characters, and setting (time and place) in fiction. | **R2.8a** Define and identify plots, settings, and characters in fiction.<br>**R2.8b** Compare and contrast plots, settings, and characters in a variety of works by a variety of authors. | **R3.8** Analyze and evaluate narrative elements including plot, character, setting and point of view to determine their importance to the story. | **R4.8** Analyze and evaluate how authors use narrative elements and tone in fiction for specific purposes. |
| **R1.9** Express own opinions about texts. | **R2.9a** Differentiate between fact and opinion.<br>**R2.9b** Express opinions about a text and support these opinions with textual evidence. | **R3.9a** Differentiate between fact and opinion in text.<br>**R3.9b** Analyze an author's purpose and offer a critical opinion of the effectiveness of the text in meeting that purpose. | **R4.9** Express and support assertions, with evidence from the text or experience, about the effectiveness of a text. |
| **R1.10** Make connections between a text and personal experiences, experiences of others, or other texts, and locate details in the text to illustrate these connections. | **R2.10** Identify themes in texts and connect them to personal experiences, experiences of others, and other texts. | **R3.10** Connect themes to personal experiences, experiences of others, and other texts, and locate evidence from texts to support or illustrate these connections. | **R4.10** Analyze and evaluate themes across a variety of texts, using textual and experiential evidence. |
| **R1.11** Identify basic cultural influences in texts. | **R2.11** Connect cultural events, ideas, settings, and influences from one text to similar texts from other cultures. | **R3.11** Compare and contrast how texts reflect historical and cultural influences. | **R4.11** Analyze the effects of cultural and historical influences on texts. |

# ALASKA CONTENT STANDARDS for English/Language Arts

The **CONTENT STANDARDS FOR ALASKA STUDENTS** were adopted by the Alaska State Board of Education in 1994 and 1995. The **ALASKA WRITING PERFORMANCE STANDARDS** support the sections of the English/Language Arts Content Standards listed to the right of this column. The Benchmark Examinations and the High School Qualifying Examination will assess students' competencies on the performance standards.

These are the English/Language Arts content standards that relate to writing.

**A. A student should be able to speak and write well for a variety of purposes and audiences. A student who meets the content standard should:**

1. apply elements of effective writing and speaking; these elements include ideas, organization, vocabulary, sentence structure, and personal style;
2. in writing demonstrate skills in sentence and paragraph structure, including grammar, spelling, capitalization, and punctuation;
4. write and speak well to inform, to describe, to entertain, to persuade, and to clarify thinking in a variety of formats, including technical communication;
5. revise, edit, and publish the student's own writing as appropriate; and
8. evaluate the student's own speaking and writing and that of others using high standards.

**D. A student should be able to think logically and reflectively in order to present and explain positions based on relevant and reliable information. A student who meets the content standard should:**

1. develop a position by
   a. reflecting on personal experiences, prior knowledge, and new information;
   b. formulating and refining questions;
   c. identifying a variety of pertinent sources of information;
   d. analyzing and synthesizing information; and
   e. determining an author's purpose.
2. evaluate the validity, objectivity, reliability, and quality of information read, heard, and seen;
3. give credit and cite references as appropriate; and
4. explain and defend a position orally, in writing, and with visual aids as appropriate.

# ALASKA WRITING PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **W1.1a** Write complete sentences with a subject and a predicate.<br>**W1.1b** Write a paragraph with a topic sentence and supporting details.<br>**W1.1c** Write short stories or compositions with a beginning, middle, and end. | **W2.1** Write a well-organized two-paragraph composition that addresses a single topic. | **W3.1** Write a coherent composition that includes a thesis statement, supporting evidence, and a conclusion. | **W4.1** Write a coherent composition with a thesis statement that is supported with evidence, well-developed paragraphs, transitions, and a conclusion. |
| **W1.2** Write for a specific audience, including self, other children, parents, and other adults. | **W2.2** Use a variety of fiction and non-fiction forms when writing for different audiences. | **W3.2** Select and use appropriate forms of fiction and non-fiction to achieve different purposes when writing for different audiences. | **W4.2** Demonstrate understanding of elements of discourse (purpose, speaker, audience, form) when completing expressive (creative, narrative, descriptive), persuasive, research-based, informational, or analytic writing assignments. |
| **W1.3a** Use a variety of simple sentence structures, and basic rules of punctuation and capitalization in written work.<br>**W1.3b** Proofread writing for legibility, spelling, capitalization, and punctuation when producing final drafts. | **W2.3a** Use a variety of simple and complex sentence structures in written work.<br>**W2.3b** Proofread and correct grammar, sentence structure, paragraph structure, punctuation, capitalization, spelling, and usage in finished written work. | **W3.3** Use the conventions of standard English including grammar, sentence structure, paragraph structure, punctuation, spelling, and usage in written work. | **W4.3** Use the conventions of standard English independently and consistently including grammar, sentence structure, paragraph structure, punctuation, spelling, and usage. |
| **W1.4a** Revise writing for detail and clarity.<br>**W1.4b** Provide appropriate feedback to peers about written work. | **W2.4a** Revise writing to improve the logical progression of ideas and supporting information.<br>**W2.4b** Revise own and others' work and provide appropriate feedback to peers based upon established criteria, to improve quality and effectiveness of writing. | **W3.4a** Revise writing to improve organization, word choice, paragraph development, and voice appropriate to the purpose.<br>**W3.4b** Form and explain own standards or judgments of quality writing. | **W4.4** Revise writing to improve style, word choice, sentence variety, and subtlety of meaning in relation to the purpose and audience. |
| **W1.5** List titles and authors of books and other materials when used as references in written work. | **W2.5** Give credit for others' ideas, images, and information by citing information about sources, including title and author. | **W3.5** List and document sources using a given format. | **W4.5** Cite sources of information using a standard method of documentation. |
| **W1.6** *This standard is addressed in the intermediate grades.* | **W2.6** Use resources such as computers, word processing software, dictionaries, and thesauruses to make choices when writing. | **W3.6** Compose and edit a composition with a word processing program. | **W4.6** *This standard is addressed in the intermediate grades, and students are expected to continue to use these skills throughout high school.* |

# ALASKA CONTENT STANDARDS for Mathematics

The **CONTENT STANDARDS FOR ALASKA STUDENTS** were adopted by the Alaska State Board of Education in 1994 and 1995. The **ALASKA MATHEMATICS PERFORMANCE STANDARDS** support the Mathematics Content Standards listed to the right of this column. The Benchmark Examinations and the High School Qualifying Examination will assess students' competencies on the performance standards.

**A. A student should understand mathematical facts, concepts, principles, and theories. A student who meets the content standard should:**

1. understand and use numeration, including
   a. numbers, number systems, counting numbers, whole numbers, integers, fractions, decimals, and percents; and
   b. irrationals and complex numbers;
2. select and use appropriate systems, units, and tools of measurement, including estimation;
3. perform basic arithmetic functions, make reasoned estimates, and select and use appropriate methods or tools for computation or estimation including mental arithmetic, paper and pencil, a calculator, and a computer;
4. represent, analyze, and use mathematical patterns, relations, and functions using methods such as tables, equations, and graphs;
5. construct, draw, measure, transform, compare, visualize, classify, and analyze the relationships among geometric figures; and
6. collect, organize, analyze, interpret, represent, and formulate questions about data and make reasonable and useful predictions about the certainty, uncertainty, or impossibility of an event.

**B. A student should understand and be able to select and use a variety of problem-solving strategies. A student who meets the content standard should:**

1. use computational methods and appropriate technology as problem-solving tools;
2. use problem solving to investigate and understand mathematical content;
3. formulate mathematical problems that arise from everyday situations;
4. develop and apply strategies to solve a variety of problems;
5. check the results against mathematical rules;
6. use common sense to help interpret results;
7. apply what was learned to new situations; and
8. use mathematics with confidence.

**C. A student should understand and be able to form and use appropriate methods to define and explain mathematical relationships. A student who meets the content standard should:**

1. express and represent mathematical ideas using oral and written presentations, physical materials, pictures, graphs, charts, and algebraic expressions;
2. relate mathematical terms to everyday language;
3. develop, test, and defend mathematical hypotheses; and
4. clarify mathematical ideas through discussion with others.

**D. A student should be able to use logic and reason to solve mathematical problems. A student who meets the content standard should:**

1. analyze situations;
2. draw logical conclusions;

3. use models, known facts, and relationships to explain the student's reasoning;
4. use deductive reasoning to verify conclusions, judge the validity of arguments, and construct valid arguments; and
5. use inductive reasoning to recognize patterns and form mathematical propositions.

**E. A student should be able to apply mathematical concepts and processes to situations within and outside of school. A student who meets the content standard should:**

1. explore problems and describe results using graphical, numerical, physical, algebraic, and verbal mathematical models or representations;
2. use mathematics in daily life; and
3. use mathematics in other curriculum areas.

## ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A1. Numeration** | | | |
| **A1.1.1** Read, write, order, count, and model one-to-one correspondence with whole numbers to 100. | **A1.2.1** Read, write, model, order, and count with positive whole numbers to 1,000,000 and negative whole numbers. | **A1.3.1** Read, write, model, and order real numbers, explaining scientific notation, exponents, and percents. | **A1.4.1** Read, write, model, order, and define real numbers and subsets. |
| **A1.1.2** Use, model, and identify place value positions of 1's, 10's, and 100's. | **A1.2.2** Use, model and identify place value positions from 0.001 to 1,000,000. | **A1.3.2** Model counting in a different base system. | **A1.4.2** Add in a different base system. |
| **A1.1.3** Model and explain the processes of addition and subtraction, describing the relationship between the operations. | **A1.2.3** Model and explain the processes of multiplication and division. Describe the relationships among the four basic operations. | | **A1.4.3** Compare and contrast the relationship between various applications of the same operation. |
| **A1.1.4** Select and use various representations of ordinal and cardinal numbers. | **A1.2.4** Identify and describe different uses for the same numerical representation. | **A1.3.4** Translate between equivalent representations of the same number. Select a representation that is appropriate for the situation. | **A1.4.4** Translate between equivalent representations of the same exponential expression. |
| **A1.1.5** Identify, model, and label simple fractions, describing and defining them as equal parts of a whole, a region, or a set. | **A1.2.5** Model and explain the process of adding and subtracting fractions with common denominators and decimals that represent money. | **A1.3.5** Describe and model the relationship of fractions to decimals, percents, ratios, and proportions. | |
| **A1.1.6** Identify, describe, and extend patterns inherent in the number system. Skip count by 2's, 5's and 10's. Add and subtract by 10. Identify even and odd numbers. | **A1.2.6** Identify and describe factors and multiples including those factors and multiples common to a pair or set of numbers. | **A1.3.6** Use, explain, and define the rules of divisibility, prime and composite numbers, multiples, and order of operations. | |
| **A1.1.7** Demonstrate the commutative and identity properties of addition. | **A1.2.7** Demonstrate the commutative and identity properties of multiplication. | **A1.3.7** Use commutative, identity, associative, and distributive properties with variables. | **A1.4.7** Recognize, describe, and use properties of the real number system. |

# ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A2. Measurement** | | | |
| **A2.1.1** Compare and order objects by various measurable attributes including calendar, temperature, length, weight, capacity, area, and volume. | **A2.2.1** Estimate and measure weights, lengths, and temperatures to the nearest unit using the metric and standard systems. | **A2.3.1** Estimate and measure various dimensions to a specified degree of accuracy. | **A2.4.1** Evaluate measurements for accuracy, precision, and error with respect to the measuring tools, methods, and the computational process. |
| **A2.1.2** Compare objects to standard and non-standard units to identify objects that are greater than, less than, and equal to a given unit. | **A2.2.2** Identify and use equivalent measurements (*e.g.,* 60 minutes = 1 hour, 7 days = 1 week). | **A2.3.2** Estimate and convert measurements within the same system. | **A2.4.2** Estimate and convert measurements between different systems. |
| | **A2.2.3** Use a variety of measuring tools; describe the attribute(s) they measure. | **A2.3.3** Use a variety of methods and tools to construct and compare plane figures. | **A2.4.3** Apply various measurement systems to describe situations and solve problems. |
| **A2.1.4** Choose a unit of measure, estimate the length or weight of objects and then measure to check for reasonableness. | **A2.2.4** Estimate and measure the dimensions of geometric figures. | **A2.3.4** Describe and apply the relationships between dimensions of geometric figures to solve problems using indirect measurement; describe and apply the concepts of rate and scale. | **A2.4.4** Use indirect methods, including the Pythagorean Theorem and right triangle trigonometry, to find missing dimensions. |
| **A2.1.5** Tell time to the nearest half hour, distinguishing between morning, afternoon, and evening. | **A2.2.5** Tell time using analog and digital clocks identifying AM and PM; find elapsed time. | **A2.3.5** Apply information about time zones and elapsed time to solve problems. | |
| **A2.1.6** Identify coins, their value, and the value of given sets of coins. | **A2.2.6** Read, write, and use money notation, determining possible combinations of coins and bills to equal given amounts; count back change for any given situation. | | |

# ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A3. Estimation and Computation** | | | |
| **A3.1.1** Make reasonable estimates of "how many" and "how much"; estimate the results of simple addition and subtraction problems. | **A3.2.1** Describe and use a variety of estimation strategies including rounding to the appropriate place value, multiplying by powers of 10 and using front-end estimation to check the reasonableness of solutions. | **A3.3.1** Apply, explain, and assess the appropriateness of a variety of estimation strategies including truncating and rounding to compatible numbers. | **A3.4.1** Use estimation to solve problems and to check the accuracy of solutions; state whether the estimation is greater or less than the exact answer. |
| **A3.1.2** Recall and use basic addition and subtraction facts orally and with paper and pencil without a calculator. | **A3.2.2** Recall and use basic multiplication and division facts orally, with paper and pencil without a calculator. | **A3.3.2** Apply basic operations efficiently and accurately, using estimation to check the reasonableness of results. | |
| **A3.1.3** Add and subtract whole numbers to 100 using a variety of models and algorithms. | **A3.2.3** Add and subtract whole numbers and fractions with common denominators to 12 and decimals, including money amounts, using models and algorithms. | **A3.3.3** Add and subtract fractions, decimals, and percents. | **A3.4.3** Add and subtract real numbers using scientific notation, powers, and roots. |
| **A3.1.4** Model multiplication as repeated addition and grouping objects; model division as "sharing equally" and grouping objects. | **A3.2.4** Multiply and divide multi-digit whole numbers by 2-digit numbers, limiting the 2-digit divisors to those that end in 0; multiply and divide decimals that represent money by whole numbers. | **A3.3.4** Multiply and divide rational numbers in various forms including fractions, decimals, and percents. | **A3.4.4** Multiply and divide real numbers in various forms including scientific notation, powers, and roots. |
| | **A3.2.5** Find equivalent fractions. Convert between fractions and mixed numbers. | **A3.3.5** Convert between equivalent fractions, decimals, percents, and proportions. Convert from exact to decimal representations of irrational numbers. | **A3.4.5** Select, convert, and apply an equivalent representation of a number for a specified situation. |
| | **A3.2.6** Develop and interpret scales and scale models. | **A3.3.6** Solve problems using ratios and proportions. | **A3.4.6** Use ratios and proportions to model and solve fraction and percent problems with variables. |

# ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A4. Functions and Relationships** | | | |
| **A4.1.1** Recognize, describe, create, and extend repeating and increasing patterns with a variety of materials including symbols, objects, and manipulatives. | **A4.2.1** Use patterns and their extensions to make predictions and solve problems; describe patterns found in the number system including those formed by multiples, factors, perfect squares, and powers of 10. | **A4.3.1** Identify numeric and geometric patterns to find the next term and predict the *nth* term. | **A4.4.1** Identify, graph, and describe the graphs of basic families of functions including linear, absolute value, quadratic, and exponential using a graphing calculator. |
| **A4.1.2** Generate and solve simple functions by identifying and applying addition and subtraction patterns. | **A4.2.2** Generate and solve simple functions by identifying and applying multiplication and division patterns. | **A4.3.2** Identify and describe how a change in one variable in a function affects the remaining variables (*e.g.,* how changing the length affects the area and volume of a rectangular prism). | **A4.4.2** Create and solve linear and quadratic equations and inequalities. |
| **A4.1.3** Use a calculator to find and extend patterns in the number system. | **A4.2.3** Use a calculator to find a missing item in a number sequence. | **A4.3.3** Use a calculator to find a missing item in an arithmetic and a geometric sequence; predict the graph of each function. | **A4.4.3** Create and solve simple systems of equations, algebraically and graphically, using a graphing calculator. |
| | **A4.2.4** Use words, lists, and tables to represent and analyze patterns. | **A4.3.4** Translate among and use tables of ordered pairs, graphs on coordinate planes, and linear equations as tools to represent and analyze patterns. | **A4.4.4** Use discrete structures such as networks, matrices, sequences, and iterations as tools to analyze patterns, expressions, and equations. |
| **A4.1.5** Complete open space sentences with missing numbers; use appropriate vocabulary including *greater than, less than,* and *equal to;* and use the correct symbols. | **A4.2.5** Explain the purpose of variables and use them in open sentences to express relationships and describe simple functions. | **A4.3.5** Find the value of a variable by evaluating formulas and algebraic expressions for given values. | **A4.4.5** Add, subtract, multiply, divide, and simplify rational expressions; add, subtract, and multiply polynomials. |

# ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A5. Geometry** | | | |
| **A5.1.1** Identify, sort, describe, model, and compare circles, triangles, and rectangles including squares regardless of orientation. | **A5.2.1** Identify and compare various triangles and quadrilaterals according to their sides and/or angles. | **A5.3.1** Identify, classify, compare, and sketch regular and irregular polygons. | **A5.4.1** Identify and use the properties of polygons, including interior and exterior angles, and circles (including angles, arcs, chord, secants, and tangents) to solve problems. |
| **A5.1.2** Identify, sort, describe, model, and compare solid figures including cubes, cylinders, and spheres. | **A5.2.2** Compare and contrast plane and solid figures (*e.g.,* circle/sphere, square/cube, triangle/pyramid) using relevant attributes, including the number of vertices, edges, and the number and shape of faces. | **A5.3.2** Model, identify, draw and describe 3-dimensional figures including tetrahedrons, dodecahedrons, triangular prisms, and rectangular prisms. | **A5.4.2** Create 2-dimensional representations of 3-dimensional objects. |
| **A5.1.3** Identify and create examples of line symmetry; compare and describe given circles, triangles, and rectangles as larger, smaller, or congruent. | **A5.2.3** Identify and model geometric figures that are congruent, similar, and/or symmetrical. | **A5.3.3** Apply the properties of equality and proportionality to solve problems involving congruent or similar shapes. | **A5.4.3** Identify congruent and similar figures using Euclidean and coordinate geometries; apply this information to solve problems. |
| **A5.1.4** Demonstrate conservation of area using drawings or manipulatives. | **A5.2.4** Distinguish between area and perimeter; find both using a variety of methods including rulers, grid paper and tiles. | **A5.3.4** Estimate and determine volume and surface areas of solid figures using manipulatives and formulas; estimate and find circumferences and areas of circles. | |
| **A5.1.5** Describe and identify geometric transformations including slides, flips, and turns. | **A5.2.5** Identify and model transformations of geometric figures, describing the motions as slides, flips, or rotations. | **A5.3.5** Draw and describe the results of transformations including translations (slides), rotations (turns), reflections (flips), and dilations (shrinking or enlarging). | **A5.4.5** Use transformations to demonstrate geometric properties. |
| **A5.1.6** Use comparative directional and positional words: *above, below, inside, outside, on, in, right and left, horizontal, vertical,* and *middle.* | **A5.2.6** Locate and describe objects in terms of their position with and without compass directions; identify coordinates for a given point or locate points of given coordinates on a grid. | **A5.3.6** Use coordinate geometry to represent and interpret relationships defined by equations and formulas including distance and midpoint. | **A5.4.6** Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines, and find possible solutions to sets of equations. |
| **A5.1.7** Draw and build familiar shapes. | **A5.2.7** Sketch and identify line segments, midpoints, intersections, parallel and perpendicular lines. | **A5.3.7** Draw, measure, and construct geometric figures including perpendicular bisectors, polygons with given dimensions and angles, circles with given dimensions, perpendicular and parallel lines. | **A5.4.7** Construct geometric models, transformations, and scale drawings using a variety of methods including paper folding, compass, straight edge, protractor, and technology. |

# ALASKA MATHEMATICS PERFORMANCE STANDARDS

| *To be assessed in Grade 3* | *To be assessed in Grade 6* | *To be assessed in Grade 8* | *To be assessed on High School Graduation Qualifying Exam* |
|---|---|---|---|
| **Between ages 5-7, students:** | **Between ages 8-10, students know and are able to do everything required at earlier ages and:** | **Between ages 11-14, students know and are able to do everything required at earlier ages and:** | **Between ages 15-18, students know and are able to do everything required at earlier ages and:** |
| **A.6 Statistics and Probability** | | | |
| **A6.1.1** Collect, record, organize, display, and explain the classification of data. | **A6.2.1** Collect, organize, and display data creating a variety of visual displays including tables, charts, and line graphs. | **A6.3.1** Collect, analyze and display data in a variety of visual displays including frequency distributions, circle graphs, box and whisker plots, stem and leaf plots, histograms, and scatter plots with and without technology. | **A6.4.1** Analyze and draw inferences from a wide variety of data sources that summarize data; construct graphical displays with and without technology. |
| **A6.1.2** Describe data from a variety of visual displays including tallies, tables, pictographs, bar graphs, and Venn diagrams. | **A6.2.2** Present the data using a variety of appropriate representations and explain the meaning of the data. | **A6.3.2** Interpret and analyze information found in newspapers, magazines, and graphical displays. | **A6.4.2** Determine the line of best fit and use it to predict unknown data values. |
| **A6.1.3** Use the terms *maximum* and *minimum* when working with a data set. | **A6.2.3** Describe and interpret a data set using mean, median, mode, and range. | **A6.3.3** Determine and justify a choice of mean, median, or mode as the best representation of data for a practical situation. | **A6.4.3** Describe data, selecting measures of central tendencies and distribution, to convey information in the data. |
| | | **A6.3.4** Make projections based on available data and evaluate whether or not inferences can be made given the parameters of the data. | **A6.4.4** Analyze the validity of statistical conclusions and the use, misuse, and abuse of data caused by a wide variety of factors including choices of scale, inappropriate choices of measures of center, incorrect curve fitting, and inappropriate uses of controls or sample groups. |
| **A6.1.5** Find and record the possibilities of simple probability experiments; explain differences between chance and certainty, giving examples. | **A6.2.5** Estimate whether a game is mathematically fair or unfair; analyze and present probability data using simple fractions. | **A6.3.5** Use tree diagrams and sample spaces to make predictions about independent events. | **A6.4.5** Analyze data from multiple events and predict theoretical probability; find and compare experimental and theoretical probability for a simple situation, discussing possible differences between two results. |
| **A6.1.6** Conduct a survey and tally the results. | **A6.2.6** Conduct simple probability experiments using concrete materials and represent the results using fractions and probability. | **A6.3.6** Design and conduct a simulation to study a problem and communicate the results. | **A6.4.6** Design, conduct, analyze, and communicate the results of multi-stage probability experiments. |

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| **B. Problem-Solving** | | | |
| **B1.1.1** Formulate problems from practical and mathematical activities. | **B1.2.1** Read and summarize a problem, using mathematical terms and symbols. | **B1.3.1** Analyze and summarize a problem using the relationships between the known facts and unknown information. | **B1.4.1** Recognize and formulate mathematical problems from within and outside the field of mathematics. |
| **B1.1.2** Develop and apply strategies including guess and check, modeling and acting out, drawings, and extending patterns to solve a variety of problems. | **B1.2.2** Select and apply a variety of strategies including making a table, chart or list; drawing pictures; making a model; and comparing with previous experience to solve problems. | **B1.3.2** Select, modify, and apply a variety of problem-solving strategies including graphing, inductive and deductive reasoning, Venn diagrams, and spreadsheets. | **B1.4.2** Apply multi-step, integrated, mathematical problem-solving strategies, persisting until a solution is found or it is clear no solution exits. |
| **B1.1.3** Predict an answer before solving a problem and compare results to check for reasonableness. | **B1.2.3** Explain and verify results of the original problem and apply what was learned to new situations. | **B1.3.3** Evaluate, interpret, and justify solutions to problems. | **B1.4.3** Verify the answer by using an alternative strategy. |

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| **C. Communication** | | | |
| **C1.1.1** Translate problems from everyday language into math language and symbols. | **C1.2.1** Use the mathematical vocabulary appropriate to the problem. | **C1.3.4** Use math vocabulary, symbols, and notation to represent information in the problem. | **C1.4.1** Use appropriate technology to represent the information and ideas in a problem. |
| **C1.1.2** Use manipulatives, models, pictures, and language to represent and communicate mathematical ideas. | **C1.2.2** Represent mathematical and practical situations using concrete, pictorial, and symbolic representation. | **C1.3.2** Represent a problem numerically, graphically, symbolically; translate among these alternative representations. | **C1.4.2** Use numerical, graphic, and symbolic representations to support oral and written communication about math ideas. |
| **C1.1.3** Use everyday language to explain thinking about problem-solving strategies and solutions to problems. | **C1.2.3** Organize and communicate mathematical problem-solving strategies and solutions to problems. | **C1.3.3** Use appropriate vocabulary, symbols and technology to explain, justify, and defend mathematical solutions. | **C1.4.3** Explain, justify and defend mathematical ideas, solutions, and methods to various audiences. |

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| **D. Reasoning** | | | |
| **D1.1.1** Draw conclusions about mathematical problems. | **D1.2.1** Draw logical conclusions about mathematical situations. | **D1.3.1** Use informal deductive and inductive reasoning in both concrete and abstract contexts. | **D1.4.1** Follow and evaluate an argument, judging its validity using inductive or deductive reasoning and logic. |
| **D1.1.2** Find examples that support or refute mathematical statements. | **D1.2.2** Given a rule or generalization, determine whether the example fits. | **D1.3.2** State counterexamples to disprove statements. | **D1.4.2** Make and test conjectures. |
| **D1.1.3** Explain why a prediction, estimation, or solution is reasonable. | **D1.2.3** Justify answers and mathematical strategies as reasonable. | **D1.3.3** Justify and defend the validity of mathematical strategies and solutions using examples and counterexamples. | **D1.4.3** Use methods of proofs including direct, indirect, and counterexamples, to validate conjectures. |

## ALASKA MATHEMATICS PERFORMANCE STANDARDS

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| **E. Connections** | | | |
| **E1.1.1** Apply mathematical skills and processes to literature. | **E1.2.1** Apply mathematical processes to social studies. | **E1.3.1** Apply mathematical skills and processes to science and humanities. | **E1.4.1** Apply mathematical skills and processes to global issues. |
| **E1.1.2** Apply mathematical skills and processes to situations with self and family. | **E1.2.2** Apply mathematical skills and processes to situations with friends and school. | **E1.3.2** Apply mathematical skills and processes to situations with peers and community. | **E1.4.2** Describe how mathematics can be used in knowing how to prepare for careers. |

# APPENDIX 2

## Practice Tests, Scoring Guides, and Test Item Maps for the Grade 6 Benchmark Exams

## THE PRACTICE TESTS

The Benchmark **PRACTICE TESTS** were developed to give students and teachers a practical way to become familiar with the kinds of test items that will appear on the Alaska Benchmark Examinations. The practice tests are in no way a predictor of the test taker's grade on the actual Benchmark tests, nor are the practice test questions the same questions that will be on the actual Benchmark tests. The type size of the actual practice tests has been reduced for purposes of this Teacher's Guide.

The **SCORING GUIDES** for the Benchmark Practice Tests provide both correct answers and the guidelines used to score "constructive-response" questions on the practice tests.

The **TEST ITEM MAPS** show the number of questions of each type that measure particular performance standards on each practice test.

# PRACTICE TEST—Reading, Grade 6



## SAMPLE QUESTIONS

**Directions:** Read the short article "Fast Tracks." Then do the two sample questions.


### Fast Tracks

The fastest person can run about 26 miles per hour. However, there are even faster speeds in the animal world. Did you know that the ostrich can run up to 40 miles per hour? The cheetah, however, wins the race. It can dash up to 60 miles per hour when running on flat ground for short distances. Now that's impressive!

**Sample A**

This passage is mostly about

Ⓐ how the cheetah wins races

Ⓑ how people can run at impressive speeds

Ⓒ how some animals can run faster than people

Ⓓ how the ostrich can run up to 40 miles per hour

**Sample B**

Look at the picture next to the article. Which of the runners pictured is most likely to win a short race?

Using the information from the article, explain why you chose that runner.

## PRACTICE QUESTIONS

**Directions:** Read the passage. Then do Numbers 1 through 6.

# Snowboarding

The winter I was twelve was an unusual one. My family moved from Bennington, Vermont to Lake Tahoe, California. Mom went off on a three-week trip to visit her mother in Michigan. My Uncle Lee moved in with us because he was between jobs. And I got a dog.

Dad let me pick her out at the neighborhood animal shelter. She was the smallest of the litter, but I thought the most beautiful.

"I hope you're not intending to use her for a watchdog," the animal technician said as we were filling out the paperwork.

"No, not really. Why do you ask?" Dad wanted to know.

"Of all the dogs here, I have never heard her make a sound. No yelps, no barks, nothing. Kind of like the cat got her tongue," and he laughed at his own joke.

I thought about this for a moment. Had I picked a defective animal? What if I needed protection at my new school? But when she looked up at me with soft blue eyes, I knew I had made the right choice.

Going to a new school was difficult. I liked my teacher Ms. Samuels well enough, but I had a hard time making friends. I was shy and self-conscious. Every day I ate lunch alone, dreaming of spending time with my new dog, Coda, or playing chess with my uncle, or accompanying Dad to the restaurant he now owned.

After he had been with us a month, my uncle announced that he was going to teach me to snowboard. Growing up in Vermont it was hard to avoid learning how to ski, but I had been dying to learn snowboarding. It was an exceptionally snowy winter, with plenty of opportunities. "Let's get out there and play," my eager uncle bellowed. A man of few words, he had never mentioned that he knew how to snowboard.

Uncle Lee and I started going out just about every day after school and Coda tagged along. She was a real snow dog, a malamute with a thick, beautiful black and white coat. While my uncle and I practiced our snowboarding techniques, she would play in the snow. She would roll in it, eat it, pick it up with her nose, and dig in it until she almost became part of the snowy mountain.

One particularly snowy day, I got separated from my uncle. I'm not sure how it happened, but suddenly I was snowboarding without him. I looked beside me expecting to see him, but all I saw was whiteness. I would have been frightened except I knew Coda was close by, and I assumed she knew her way home—that dog seemed to know everything else about being in the snow.

I figured the best thing to do would be to call for my uncle so I did. I called until I became hoarse. Then I realized that Coda was making no attempt to blaze a trail anywhere. She was playing like she always did. When I called to her, she seemed to think it was a game because she would look at me for a minute, run around in a circle, bury her head in the snow and come up with snow stuck to her nose and mouth, looking at me and wagging her tail.

The dog's silliness relaxed me, and I found myself snowboarding effortlessly. I had no doubt that my uncle would find me, so I just kept going. Unfortunately, my Olympic performance didn't last long. I had always wondered why my uncle had cautioned me to stay on the trails and away from the area around trees. Now I wondered no more as I lay in a hole some ten feet deep, snow just about covering every part of me. The fall hadn't been painful, but it had shocked me. My feet were still attached to my snowboard, which was stuck in debris near the top of the hole. I was face down, and my hands were wedged up against my body. I had no idea how I was going to get out!

Without the use of my hands, I couldn't really dig. I tried to turn around, but there wasn't enough room to get right side up. I was stuck! I was almost ready to cry when suddenly I felt a tug on my jacket. At first I thought it might be a bear, but then I could hear the sound of Coda's breathing. I knew that I was too heavy for her to pull me entirely out, but if she could just help me to free a hand, maybe I could find something to hold onto or twist myself around.

Was Coda reading my mind? She yanked and pulled until I could move my arm again. With slightly more range of motion, I tried to dig out my other arm and pull myself around, but I wasn't making any real progress. Even from where I was, I could feel Coda beside me, motionless as the landscape around us. It was some comfort to know she was there.

It was then that I heard my uncle's voice calling. I knew my voice would be too muffled down in the hole with a bunch of snow on top of me, so I didn't even try to shout. Suddenly Coda began to bark. She barked and barked and barked.

Within minutes, Uncle Lee was helping me out. I don't know how long I was down in that hole, but it was too long. I was shivering and exhausted. All I could think was that if it hadn't been for Coda, my uncle would have never found me. Too tired to talk, I shivered some more. My uncle didn't scold me. He just gave me his jacket to put on over my own, said "Good dog, Coda," and we headed for home.

1. This story is mostly about

   Ⓐ a child's relationship with his family

   Ⓑ a child whose dog saves him from a snowboarding accident

   Ⓒ a child who realizes that snowboarding is a dangerous sport

   Ⓓ a lonely child who moves to a new place and goes to a new school

2. Why was the winter in the story an unusual one for the narrator?

   Ⓐ The narrator was a better student.

   Ⓑ The narrator was shyer than usual.

   Ⓒ There were changes in the narrator's family life.

   Ⓓ There was more snow for the narrator to play in.

3. The narrator describes his snowboarding as an "Olympic performance" because the narrator

   Ⓐ was putting on a great show

   Ⓑ was fooling around in the snow

   Ⓒ was snowboarding on a racing course

   Ⓓ was doing really well at snowboarding

4. Which of the following statements shows the narrator's opinion?

   Ⓐ I had no doubt that my uncle would find me.

   Ⓑ My family moved from Bennington, Vermont to Lake Tahoe, California.

   Ⓒ I looked beside me expecting to see him, but all I saw was whiteness.

   Ⓓ After he had been with us a month, my uncle announced that he was going to teach me to snowboard.

5. At the beginning of the story, the narrator mentions that Coda never barks. This is important to the story because

   Ⓐ snow dogs usually bark

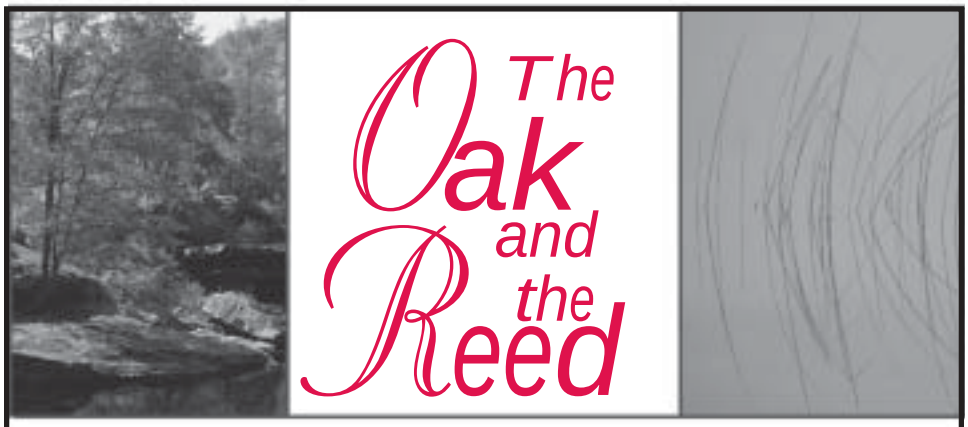
   Ⓑ this is a good type of dog for a child to have

   Ⓒ later the dog's barking saves the child's life

   Ⓓ there is no such thing as a dog that does not bark

6. What are <u>two</u> ways that the child might have avoided falling into the hole? Use details from the story to explain your answer.

**Directions:** Read this retelling of a story by Aesop, a writer from over 2,000 years ago. Then do Numbers 7 through 12.



# The Oak and the Reed

Once there was a large oak growing by the side of a river. Near the oak grew a thin reed. When the breezes blew, only the leaves on the oak moved, but the reed moved all around.

One day the oak said to the reed, "Why do you let the wind treat you like that? Stand up tall. Don't be pushed around!"

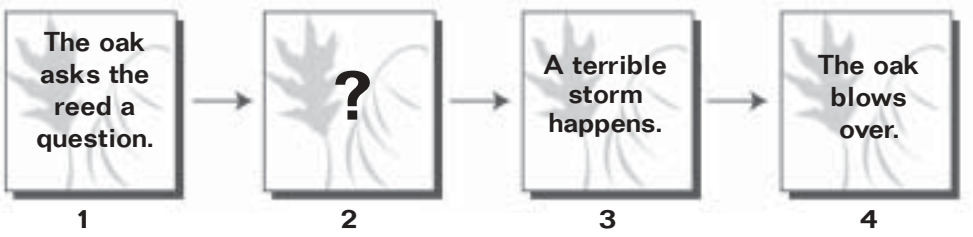
The reed answered, "Sometimes it is good to stand tall and still. Sometimes it is not. You think that I am losing to the wind, but I am not." The oak snorted, and looked away.

Then one day there was a terrible storm. The winds blew and blew, harder and harder. Finally, with a crash!, the oak blew over. The reed bent back and forth with the wind, but when the storm was over the reed stood tall again.

7. The style of this story is most like that of
   - Ⓐ a fable
   - Ⓑ a myth
   - Ⓒ an epic
   - Ⓓ a biography

8. In the passage the oak tree snorts because
   - Ⓐ this is a sound that trees usually make
   - Ⓑ the tree thinks it is better than the reed
   - Ⓒ the tree does not agree with what the reed has said
   - Ⓓ the tree is showing that it is not afraid of the wind

Use the story diagram for Number 9.




9. Which of these should go in Box 2?

Ⓐ Breezes blow.

Ⓑ The reed stands tall again.

Ⓒ The reed defends its actions.

Ⓓ The oak and reed grow side by side.

10. Which of these statements best summarizes the moral of this story?

Ⓐ It is always best to be tall and straight.

Ⓑ It is better to be flexible than stubborn.

Ⓒ It is wise to be careful when dealing with tall trees.

Ⓓ It is better to know your own strengths than those of your friends.

11. This passage takes place

Ⓐ in a field

Ⓑ on a prairie

Ⓒ at the beach

Ⓓ on a riverbank

12. Explain why the reed knows that it is not losing to the wind. Use details from the passage to support your answer.

# SCORING GUIDE—Reading, Grade 6

## MULTIPLE-CHOICE QUESTIONS

**Sample A** **C**

1. **B**
2. **C**
3. **D**
4. **A**
5. **C**
7. **A**
8. **C**
9. **C**
10. **B**
11. **D**

## CONSTRUCTED-RESPONSE QUESTIONS

**Sample B**

Look at the picture next to the article. Which of the runners pictured is most likely to win a short race? Using the information from the article, explain why you chose that runner.

**Exemplary Response:**

The cheetah is most likely to win a short race.

I chose the cheetah as the winner of the short race because the article says that it runs up to 60 miles per hour on flat ground for short distances.

**Score Points:** 2 points possible

- 1 point for cheetah
- 1 point for supporting evidence from the article

**Item 6**

What are <u>two</u> ways that the child might have avoided falling into the hole? Use details from the story to explain your answer.

**Exemplary Response:**

- The child could have asked his uncle why he kept warning him to stay away from the trees when snowboarding. This would have been better than waiting until he actually fell in a hole to figure it out for himself.
- The child could have listened to the uncle, because the uncle had a lot more experience snowboarding.
- The child could have paid more attention. The child thinks he is doing an "Olympic performance." The child is not looking for possible dangers.
- The child could have stayed put when he first missed his uncle, instead of continuing to snowboard by himself.

**Score Points:** 2 points possible

- 1 point for any two of the above exemplary responses with a supporting detail from the story
- 1 point for identifying any two ways that the child may have avoided falling into the hole but without supporting details from the story

**Item 12**

Explain why the reed knows that it is not losing to the wind. Use details from the passage to support your answer.

**Exemplary Response:**

Because the wind can bend the reed, but it knows that it will survive the storm and not be knocked over like the oak.

**Score Points:** 2 points possible

- 1 point for explanation—the reed knows it will not be damaged by the storm
- 1 point for detail such as it bends and doesn't break

# TEST ITEM MAP—Reading, Grade 6

Number of Test Questions by Performance Standard

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **Reading Totals** | **30** | **5** | **1** | **100%** | **41** |
| **R2.1** Use phonics; determine meaning of unfamiliar words | 3 | 1 | | 12% | 5 |
| **R2.2** Infer meaning; identify themes | 3 | 1 | | 10% | 4 |
| **R2.4** Retell stories; restate and summarize information | 4 | | | 10% | 4 |
| **R2.5** Clarify and connect main ideas | 3 | | 1 | 15% | 6 |
| **R2.6** Read and follow multi-step directions | 5 | 1 | | 17% | 7 |
| **R2.7** Explain characteristics of genres | 4 | | | 10% | 4 |
| **R2.8** Define and identify plots, settings, characters | 4 | 1 | | 15% | 6 |
| **R2.9** Make and support opinions; differentiate fact and opinion | 4 | 1 | | 12% | 5 |

## THE PRACTICE TESTS

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# PRACTICE TEST—Writing, Grade 6



## SAMPLE QUESTIONS

### Sample A

**Directions:** A student wrote a paragraph about a school game. There are some mistakes that need correcting.

1 After school, we checked out the big game. 2 Playing the team from across town. 3 The game lasted for over three hours, but it was exciting the whole time. 4 We won in the final minute!

Choose the best way to write Sentence 2.

Ⓐ Our team playing the team from across town.

Ⓑ Having to play the team from across town.

Ⓒ Our team was playing the team from across town.

Ⓓ Best as it is: Playing the team from across town.

### Sample B

Where would this sentence best fit in the paragraph?

*Now we're the best team in the city.*

Ⓐ after Sentence 1

Ⓑ after Sentence 2

Ⓒ after Sentence 3

Ⓓ after Sentence 4

### Sample C

Choose the word that best completes the sentence.

I _____ writing a letter.

Ⓐ is
Ⓑ are
Ⓒ am
Ⓓ were

### Sample D

There are four mistakes in this paragraph. Let's correct them together.

In the summer, the days are more longer, so there is time to do things I enjoy. I can ride my bike. And go swimming. I can also plays in the park with my friends.

## PRACTICE QUESTIONS

**Directions:** Jill wrote a report for her science class. There are some mistakes that need correcting.

1 Have you ever wonder what makes a rabbit different from a hare? 2 Although they look alike, hares are usually bigger, have longer ears, and much longer hind legs. 3 Actually, it is more easiest to tell rabbits and hares apart at birth because of three major differences. 4 Rabbits are born blind have no fur and cannot move around. 5 Called kits or kittens, and young hares are called leverets. 6 A Belgian hare is really a rabbit, and a jack rabbit is really a hare.

1. Where would this sentence best fit in the paragraph?

*Hares are born with their eyes open, have a soft covering of fur, and can move around easily just a few hours after birth.*

Ⓐ after Sentence 1
Ⓑ after Sentence 2
Ⓒ after Sentence 4
Ⓓ after Sentence 5

2. Choose the best way to write Sentence 1.

Ⓐ Wondered what makes a rabbit different from a hare?

Ⓑ Wondering what makes a rabbit different from a hare, have you?

Ⓒ Have you ever wondered what makes a rabbit different from a hare?

Ⓓ Best as it is: Have you ever wonder what makes a rabbit different from a hare?

3. Choose the best way to write Sentence 3.

Ⓐ Actually, it is most easy to tell rabbits and hares apart at birth because of three major differences.

Ⓑ Actually, it is easiest to tell rabbits and hares apart at birth because of three major differences.

Ⓒ Actually, it is more easy to tell rabbits and hares apart at birth because of three major differences.

Ⓓ Best as it is: Actually, it is more easiest to tell rabbits and hares apart at birth because of three major differences.

4. Choose the best way to write Sentence 4.

Ⓐ Rabbits are born blind, have no fur and cannot move around.

Ⓑ Rabbits are born blind, have no fur, and cannot move around.

Ⓒ Rabbits are born, blind, have no fur and cannot move around.

Ⓓ Best as it is: Rabbits are born blind have no fur and cannot move around.

5. Choose the best way to write Sentence 5.

Ⓐ Young rabbits are called kits or kittens, and young hares are called leverets.

Ⓑ When calling young rabbits kits or kittens, and young hares are called leverets.

Ⓒ Kits or kittens are calling young rabbits, and young hares are called leverets.

Ⓓ Calling young rabbits, and young hares, kits or kittens and leverets.

6. Choose the sentence that does <u>not</u> belong in the paragraph.

Ⓐ Sentence 1

Ⓑ Sentence 3

Ⓒ Sentence 4

Ⓓ Sentence 6

Now read the second part of Jill's report.

1 Hares are not as social as rabbits. 2 Hares rest alone in hollows which they make underground. 3 Because rabbits and hares look so similar, they are easily confused. 4 Both rabbits and hares sleeping during the day and look for food at night. 5 In some places they are considered pests. 6 They eat and destroy farm crops.

7. Choose the best way to write Sentence 4.

Ⓐ Both rabbits and hares slept during the day and look for food at night.
Ⓑ Both rabbits and hares sleeps during the day and look for food at night.
Ⓒ Both rabbits and hares sleep during the day and look for food at night.
Ⓓ Best as it is: Both rabbits and hares sleeping during the day and look for food at night.

8. Where would this sentence best fit in the paragraph?

*Rabbits live in groups in grasslands or open woodlands where they dig connecting tunnels.*

Ⓐ after Sentence 1
Ⓑ after Sentence 2
Ⓒ after Sentence 3
Ⓓ after Sentence 4

9. Choose the sentence that does <u>not</u> belong in the paragraph.

Ⓐ Sentence 1
Ⓑ Sentence 3
Ⓒ Sentence 4
Ⓓ Sentence 5

10. Which of these best combines Sentences 5 and 6?

Ⓐ In some places they are considered pests because they eat and destroy farm crops.
Ⓑ They are considered pests in some places after they eat and destroy farm crops.
Ⓒ They are considered pests in some places however they eat and destroy farm crops.
Ⓓ In some places they are considered pests, so they eat and destroy farm crops.

11. Imagine that you are walking home from school one day and you find a treasure map. On the lines below and on the next pages, write a story about what you have to do to find the hidden treasure, what the treasure turns out to be, and what happens after you find it. You do not have to use all the lines.

☑ For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

Use the **Writing Skills Checklist** below

- to help you plan your writing
- to check your writing when you are done

**Writing Skills Checklist**

1. Have you written a story that is supported with details, has well-developed paragraphs, and has a beginning, a middle, and an end?
2. Have you written a story that will make sense to the person who reads it?
3. Have you written complete sentences?
4. Have you used correct grammar?
5. Have you used correct capitalization and punctuation?
6. Have you spelled all the words correctly?
7. Have you written your story clearly so that anyone can read your writing?

*[More lines follow]*

**Directions:** We all know about George Washington, the father of our country, but George Washington Carver may not be as well-known. The following paragraphs tell you a little about this other George Washington.

Although he was born to slave parents in 1861, after the Civil War ended, he taught himself to read. He was accepted into Iowa Agricultural College in 1891. Carver was also interested in art, but "wanting to be of the greatest good to the greatest number of people," he decided to focus his efforts on science and botany.

12. Choose the best topic sentence for the paragraph.

Ⓐ George Washington Carver is probably best known for his research in agriculture.

Ⓑ It is hard to imagine that products such as ink or shampoo can come from peanuts.

Ⓒ Thanks to George Washington Carver, many who worked harvesting cotton turned to raising peanuts, which grew more successfully.

Ⓓ The story of agriculture is told by the people who work in the fields to grow and harvest our food.

13. Choose the sentence that best completes the paragraph about George Washington Carver.

Eventually, he became head of the Tuskegee Agriculture Department in Alabama. _____. From these two common plants he created over 300 products. He developed paper, ink, shaving cream, linoleum, plastics, and bleach from the peanut and the sweet potato.

Ⓐ At Tuskegee, he worked long hours for very little pay.

Ⓑ At Tuskegee, he began studying sweet potatoes and peanuts.

Ⓒ Carver knew what he wanted to study once he got to Tuskegee.

Ⓓ Carver paid little attention to how difficult his studies were at Tuskegee.

14. A student wrote a report on memorization. There are <u>six</u> mistakes in grammar, punctuation, capitalization, and spelling. Draw a line through each mistake and write the correction in the space above it.

Did you know that people have two types of Memory. Short-term memory keeps a fact for just about as long as a person is actively thinks about it. Long-term memory holds onto complicated information for years or longer. Short-term and long-term memory is stored in different physical part of the brain.

With practice, anyone can remember things more easily. One of the easiest ways to remember something is to make the information rhyme. Another way is to make a mental picture of something, seeing it clearly in you're mind.

15. Choose the sentence that is complete and written correctly.

Ⓐ Excellent study habits in the long run.

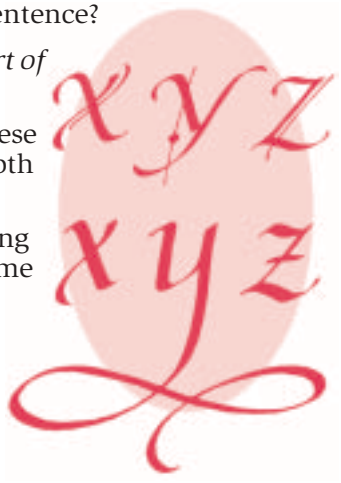
Ⓑ Always sit up straight, good lighting.

Ⓒ When sleepy it is difficult, if not impossible.

Ⓓ Study at the same time each night.

16. Which of the following best supports the topic sentence?

*It is easy to learn calligraphy, which is the art of beautiful writing.*




Ⓐ Chinese calligraphy is closely related to Chinese painting. The same kind of brush is used for both art forms.

Ⓑ Just a few materials are needed to begin making letters. With paper, pen, and ink, and a little time for practice, you can master this art.

Ⓒ Other recommended supplies include pencils, tape, eraser, water container, and a rag for cleaning pen tips. The serious student might also benefit from the use of a photocopier to enlarge and reduce lettering.

Ⓓ With the development of the ball point pen and the typewriter, calligraphy declined in popularity. But in 1980 an Englishman, William Morris, attempted to revive the art.

17 Choose the sentence that is complete and written correctly.

Ⓐ At a student assembly.

Ⓑ Being respectful of the other classes.

Ⓒ Entering and exiting quietly.

Ⓓ Your class will gain a good reputation.

18 Think about your best friend or someone you would like to have as a best friend. On the lines below, write a paragraph describing him or her. Explain how this person acts, what he or she looks like, what he or she likes to do, and why he or she is your best friend or could be your best friend. You do not have to use all the lines.

For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

*[More lines follow]*

# SCORING GUIDE—Writing, Grade 6

## MULTIPLE-CHOICE QUESTIONS

**Sample A** C

**Sample B** D

**Sample C** C

1. **C**
2. **C**
3. **B**
4. **B**
5. **A**
6. **D**
7. **C**
8. **B**
9. **B**
10. **A**
12. **A**
13. **B**
15. **D**
16. **B**
17. **D**

## CONSTRUCTED-RESPONSE QUESTIONS

**Sample D**

**Exemplary Response:**

In the summer, the days are ~~more longer,~~ longer so there is time to do things I enjoy. I can ride my ~~bike. And~~ bike and go swimming. I can also ~~plays~~ play in the park with my friends.

**Score Points:** 4 points possible

- 1 point for changing more longer to longer [grammar]
- 1 point for changing bike. to bike [punctuation]
- 1 point for changing And to and [capitalization]
- 1 point for changing plays to play [grammar]

**Item 11**

Imagine that you are walking home from school one day and you find a treasure map. On the lines below and on the next pages, write a story about what you have to do to find the hidden treasure, what the treasure turns out to be, and what happens after you find it. You do not have to use all the lines.

For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

## RUBRIC

**Score Points:** 6 points possible

**6 POINTS**

### Ideas and Content

- ideas are fresh, original, and/or insightful
- ideas are based on the writer's knowledge and/or experience
- details are relevant, telling, and contribute to the whole
- content goes beyond the obvious or predictable
- topic makes a point or tells a story

### Organization

- sequencing of ideas and details is logical and effective
- introduction is inviting—draws in the reader
- conclusion is satisfying—leaves reader with a sense of resolution
- transitions are thoughtful, clearly show how ideas connect
- organization flows smoothly, seems effortless

### Voice

- language is highly individual
- reader senses the person behind the words, feels an interaction with the writer
- tone gives the writing flavor, adds interest
- language is appropriate for purpose and audience
- narrative writing seems honest, appealing, heartfelt
- expository or persuasive writing reflects a strong commitment to the topic; anticipates reader's questions, shows why the reader should care or want to know more

### Word Choice

- words are specific, accurate, striking
- language is natural, not overdone
- verbs are lively
- nouns and modifiers are precise
- clichés and jargon are used sparingly and only for effect

### Sentence Fluency

- sentence construction makes meaning clear
- sentences are purposeful and build upon each other
- the writing has cadence; the writer has thought about sound as well as meaning
- sentences vary in length and structure
- fragments are used only for style or effect
- dialogue, if used, sounds natural

### Conventions

- paragraphing reinforces the organizational structure
- grammar and usage are correct (few, if any, errors) and contribute to clarity and style
- punctuation is accurate (few, if any, errors) and guides the reader through the text
- spelling is generally correct, even of more difficult words
- the writer may manipulate conventions for stylistic effect

## 5 POINTS

### Ideas and Content

- ideas are based on the writer's knowledge and/or experience
- details are relevant, telling, and contribute to the whole
- topic makes a point or tells a story
- some ideas are fresh and original

### Organization

- sequencing of ideas and details is logical and effective
- introduction is inviting—draws in the reader
- conclusion is satisfying—leaves reader with a sense of resolution
- transitions are thoughtful, clearly show how ideas connect
- organization usually flows smoothly

### Voice

- reader senses the person behind the words
- there are occasional moments that surprise, amuse, or move the reader
- tone gives the writing flavor, adds interest
- language is appropriate for purpose and audience
- narrative writing seems honest, appealing, heartfelt
- expository or persuasive writing reflects a strong commitment to the topic

### Word Choice

- words are specific and accurate
- lively verbs and picturesque words and phrases are occasionally used
- language is natural, not overdone
- verbs are lively
- nouns and modifiers are precise
- clichés and jargon are used sparingly and only for effect

### Sentence Fluency

- sentence construction makes meaning clear
- sentences are purposeful and build upon each other
- sentences vary in length and structure
- fragments are used only for style or effect
- dialogue, if used, sounds natural

### Conventions

- paragraphing reinforces the organizational structure
- grammar and usage are correct (few, if any, errors) and contribute to clarity and style
- punctuation is accurate (few, if any, errors)
- spelling is generally correct, even of more difficult words

## 4 POINTS

### Ideas and Content

- topic and direction are evident, but more information is needed to "fill in the blanks"
- ideas draw on knowledge and/or experience but may not move beyond general observations to specifics
- details are reasonably clear but may not be detailed, personalized, or expanded

- supporting details are present but may not "flesh out" the main point or story line
- original ideas may be blended with ones that are more obvious or predictable

### Organization

- sequencing is usually logical but may be predictable or distracting
- introduction is recognizable but may not create a strong sense of anticipation
- conclusion is recognizable but may not tie up all loose ends
- transitions often work well but some connections between ideas may be unclear
- pacing is fairly well controlled but there may be some lapses (*e.g.,* moving ahead too quickly or spending too much time on less important details)
- organization mostly supports the main point or story line, with occasional lapses

### Voice

- writing communicates in an earnest, pleasing manner
- voice is inconsistent: it may emerge strongly, then retreat behind general, dispassionate language
- writing hides as much of the writer as it reveals
- writer seems aware of audience and purpose but often weighs words too carefully or discards personal insights in favor of safe generalities

### Word Choice

- words are mostly correct and adequate but may lack flair and color
- familiar words and phrases communicate
- attempts at colorful language are made but some may be overdone
- clichés and jargon may be used occasionally in place of fresh language

### Sentence Fluency

- sentences are grammatical and hang together
- some variation in sentence length and structure; sentence beginnings are not all alike
- some transitions between sentences are missing or hidden
- parts may be stiff, awkward, choppy, or gangly
- dialogue, if used, sounds stiff at times

### Conventions

- paragraphing is attempted but some paragraphs run together or begin in the wrong place
- problems with grammar or usage are not serious enough to impede or distort meaning
- terminal punctuation is usually correct; internal punctuation is sometimes missing or incorrect
- spelling is usually correct or reasonably plausible on common words; misspellings do not impede communication

## 3 POINTS

### Ideas and Content

- topic and direction are evident, but writer may digress and go in a different direction or introduce a different topic
- ideas may not draw on knowledge and/or experience; may be general observations
- details are reasonably clear but may not be detailed, personalized, or expanded
- supporting details are present but may not "flesh out" the main point or story line or may be irrelevant to it
- original ideas are rare or absent

### Organization

- sequencing is usually logical but there may be lapses or digressions
- there may be an attempt to write an introduction or conclusion but it may not be clearly recognizable as such; a conclusion, in particular, may be absent
- transitions may be attempted but not work well; connections between ideas may be unclear
- there are frequent lapses in pacing
- there is an attempt at organization but it may depart from supporting the main point or story line

### Voice

- writing communicates but without much style or interest
- writing hides the writer; the reader has little or no sense of the writer behind the words
- writer shows some awareness of audience and/or purpose but is inconsistent
- writer speaks in a monotone

### Word Choice

- words are mostly correct and adequate with some lapses
- familiar words and phrases communicate with some lapses
- attempts at colorful language are rare or absent
- clichés and jargon may be used as a crutch

### Sentence Fluency

- sentences are usually grammatical and hang together with some lapses
- little variation in sentence length and structure; most sentence beginnings are alike
- many transitions between sentences are missing or hidden
- fragments may be present
- dialogue, if used, sounds stiff and unnatural

### Conventions

- paragraphing is attempted but many paragraphs run together or begin in the wrong place
- problems with grammar or usage may be serious enough to impede or distort meaning in some instances but not overall
- terminal punctuation is usually correct; internal punctuation is sometimes missing or incorrect, and errors may impede or distort meaning in some instances
- spelling errors may impede or distort meaning in some instances but not overall

## 2 POINTS

### Ideas and Content

- topic and direction are not evident; the writer has not defined the topic in a meaningful, personal way
- information is very limited or unclear
- text may be repetitious or read like a collection of disconnected, random thoughts
- the writer does not distinguish the main ideas or critical points from the supporting details or less critical points

### Organization

- sequencing needs work
- there is no real lead or introduction to set up what follows
- conclusion is missing or does not wrap things up
- transitions seldom work well, with many connections between ideas unclear
- pacing feels awkward; the writer slows to a crawl when the reader wants to move on, and vice versa
- problems with organization make it hard for the reader to get a grip on the main point or story line

### Voice

- it is hard to sense the writer behind the words
- the writer does not seem to reach out to an audience or to anticipate the reader's interests or questions
- writing may communicate on a functional level but does not move or involve the reader
- writer does not seem sufficiently at home with the topic to take risks, share personal insights, or make the topic/story personal and real for the reader

### Word Choice

- language is so vague and general that only the most general message comes through (*e.g.,* It was a fun time. We did lots of neat stuff.)
- persistent redundancy distracts the reader
- words are often used incorrectly, making the message hard to decipher
- clichés and jargon frequently serve as a crutch
- problems with language leave the reader wondering what the writer is trying to say

### Sentence Fluency

- sentences are choppy, incomplete, rambling, or awkward; there may be many fragments
- phrasing does not sound natural; the reader must sometimes reread to get the meaning
- many sentences begin the same way and follow the same pattern (*e.g.,* subject-verb-object) in a monotonous pattern
- transitions between sentences are missing or hidden, or endless connectives create a massive jumble of language in which clear beginnings and endings are lost

### Conventions

- paragraphing is missing, irregular, or so frequent (*e.g.,* every sentence) that it has no relationship to the organizational structure of the text
- errors in grammar or usage are very noticeable and may affect meaning

- punctuation is often missing or incorrect
- spelling errors are frequent, even of common words
- the reader must read once to decode, then again for meaning

## 1 POINT

### Ideas and Content

- topic and direction are missing
- information is very limited or unclear
- text may be repetitious, or may read like a collection of disconnected, random thoughts

### Organization

- sequencing is absent
- there is no introduction or conclusion
- transitions are absent
- organization is absent; writing may be a brief list

### Voice

- the writer seems unaware of an audience or reader; writing seems "painful" to the writer
- writing may not communicate on a functional level
- writer seems uncomfortable with the topic

### Word Choice

- language is so vague, inaccurate, and/or general that even the most general message does not come through
- words are frequently used incorrectly, making the message hard to decipher
- problems with language leave the reader unable to understand what the writer is trying to say most of the time

### Sentence Fluency

- sentences are choppy, incomplete, rambling, or awkward; there may be many fragments
- the reader must frequently pause or reread
- sentences begin the same way and follow the same pattern (*e.g.*, subject-verb-object) in a monotonous pattern

### Conventions

- paragraphing is missing, irregular, or so frequent that it has no relationship to the organizational structure of the text
- errors in grammar or usage are frequent and impede meaning
- punctuation is often missing or incorrect
- spelling errors are frequent and impede meaning
- the reader may be unable to decode the writing

**Item 14**

**Exemplary Response:**

Did you know that people have two types of ~~Memory.~~ memory? Short-term memory keeps a fact for just about as long as a person is actively ~~thinks~~ thinking about it. Long-term memory holds onto complicated information for years or longer. Short-term and long-term memory ~~is~~ are stored in different physical ~~part~~ parts of the brain.

With practice, anyone can remember things more easily. One of the easiest ways to remember something is to make the information rhyme. Another way is to make a mental picture of something, seeing it clearly in ~~you're~~ your mind.

**Score Points:** 6 points possible

- 1 point for changing Memory to memory [capitalization]
- 1 point for changing memory. to memory? [punctuation]
- 1 point for changing thinks to thinking [grammar]
- 1 point for changing is to are [grammar]
- 1 point for changing part to parts [grammar]
- 1 point for changing you're to your [spelling]

**Item 18**

Think about your best friend or someone you would like to have as a best friend. On the lines below, write a paragraph describing him or her. Explain how this person acts, what he or she looks like, what he or she likes to do, and why he or she is your best friend or could be your best friend. You do not have to use all the lines.

For this answer, make sure you use complete sentences and check your work for correct spelling, capitalization, and punctuation.

**RUBRIC**

**4 POINTS**

**Score Points:** 4 points possible

- the writer defines and stays on topic
- supporting details are relevant, develop the topic, and provide important information
- ideas and/or details are explicitly connected to the topic
- topic is developed in a logical, organized, sequential way
- words are accurate, specific, and appropriate for the purpose and audience
- colorful or figurative language may be attempted
- there is a variety of sentence structures
- sentences are purposeful, with clear transitions
- sentence structures are correct (few, if any, errors)

- grammar and usage are correct (few, if any, errors)
- punctuation and capitalization are correct (few, if any, errors)
- spelling is generally correct, even on more difficult words (few, if any, errors)

## 3 POINTS

- writer defines and stays on topic but does not fully develop it
- supporting details are relevant but may be limited, overly general, or less important; main idea may not be clearly delineated from the details
- writer attempts to develop the topic in a logical, organized, sequential way but may falter
- ideas and/or details are connected with the topic implicitly rather than explicitly
- words are mostly accurate, specific, and appropriate for the purpose and audience
- sentence structures are simple but accurate
- there may be an attempt to vary sentence structures
- transitions between some sentences may be missing or unclear
- grammar and usage are mostly correct and errors do not impede meaning
- punctuation and capitalization are mostly correct and errors do not impede meaning
- spelling errors are limited to more difficult words and do not impede meaning

## 2 POINTS

- topic may be defined but not developed, or writing may be a collection of ideas from which no central topic emerges, or topic may be defined, but writer digresses from it
- supporting details are minimal or many are irrelevant
- main idea is not clearly delineated from the details
- writer does not attempt to develop the topic in a logical, organized, sequential way; writing may be a list rather than a developed paragraph
- ideas and/or details are not connected with the topic, even implicitly
- some words are not accurate, specific, or appropriate for the purpose and audience
- sentences may be choppy or repetitive; there may be some sentence fragments
- there is no attempt to vary sentence structures
- transitions between sentences are missing or unclear
- errors in grammar and usage may impede meaning in some instances
- errors in punctuation and capitalization may impede meaning in some instances
- spelling errors in common words may be present and may impede meaning in some instances

## 1 POINT

- topic, idea, or story line is not defined
- supporting details are absent or irrelevant
- there is no evidence of organization; writing may be a brief list
- many words are not accurate, specific, or appropriate for the purpose and audience
- sentences are simple, repetitive; there may be many fragments
- errors in grammar and usage may severely impede meaning
- errors in punctuation and capitalization may severely impede meaning
- spelling errors are numerous and may severely impede meaning

# TEST ITEM MAP—Writing, Grade 6

Number of Test Questions by Performance Standard

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **Writing Totals** | **29** | **6** | **1** | **100%** | **58** |
| **W2.1** Write compositions for audiences<br>**W2.2** Use a variety of forms | 0 | 4 | 1 | 38% | 22 |
| **W2.3** Proofread and correct grammar, spelling, capitalization, punctuation, and sentence and paragraph construction | 15 | 1 | | 36% | 21 |
| **W2.4** Revise writing to improve logical progression and supporting information | 14 | 1 | | 26% | 15 |

## THE PRACTICE TESTS

The Benchmark **PRACTICE TESTS** were developed to give students and teachers a practical way to become familiar with the kinds of test items that will appear on the Alaska Benchmark Examinations. The practice tests are in no way a predictor of the test taker's grade on the actual Benchmark tests, nor are the practice test questions the same questions that will be on the actual Benchmark tests. The type size of the actual practice tests has been reduced for purposes of this Teacher's Guide.

The **SCORING GUIDES** for the Benchmark Practice Tests provide both correct answers and the guidelines used to score "constructive-response" questions on the practice tests.

The **TEST ITEM MAPS** show the number of questions of each type that measure particular performance standards on each practice test.

# PRACTICE TEST—Mathematics, Grade 6



## SAMPLE QUESTIONS

### Sample A

John has 13 red balloons and 10 blue balloons. How many balloons does he have in all?

Ⓐ 13

Ⓑ 14

Ⓒ 23

Ⓓ 24

### Sample B

Tina had soup, a sandwich, and juice for lunch. Which of these is closest to the amount of money she spent all together?

Ⓐ $4.00

Ⓑ $5.00

Ⓒ $6.00

Ⓓ $7.00


### Sample C

Wayne had 6 math problems to complete. He started working on them at 4:00 P.M. He completed the first problem at 4:04 P.M., and the second at 4:08 P.M. Wayne completed each problem in the same amount of time without taking any rest breaks. How many minutes did it take Wayne to complete all 6 math problems?

Answer: _____ minutes

Write a rule Wayne can use to determine how many minutes it would take him to complete any number of math problems.

Rule: _____

## PRACTICE QUESTIONS

1. Which number is a multiple of 6 ?

   Ⓐ 16
   Ⓑ 28
   Ⓒ 42
   Ⓓ 56

2. What number should be placed in the ☐ to make the number sentence true? 4 x 3 x 2 = ☐ x 2 x 4

   Ⓐ 1
   Ⓑ 2
   Ⓒ 3
   Ⓓ 4

3. The recipe for Tommy's famous chocolate chip cookies calls for $\frac{3}{4}$ cup of chocolate chips. Tommy wants to triple the recipe.
   What is $\frac{3}{4} + \frac{3}{4} + \frac{3}{4}$ ?

   Ⓐ $1\frac{1}{2}$
   Ⓑ 2
   Ⓒ $2\frac{1}{4}$
   Ⓓ 3

4. Mike takes ten coins out of his pocket. They add up to exactly $0.49. If the coins consist of pennies, nickels, and dimes, how many of each coin does Mike have?

**Answer:**_____ **pennies**

**Answer:**_____ **nickels**

**Answer:**_____ **dimes**

5. Mr. Brower wants to buy enough string to hang his students' art projects. Mr. Brower wants to hang 30 art projects. He will use 6 inches of string for each project. What is the least amount of string, in feet, he should buy?

   Ⓐ 5 feet
   Ⓑ 15 feet
   Ⓒ 60 feet
   Ⓓ 180 feet

6. What is the place value position of the 2 in the number 726,309.54?

   Ⓐ thousands

   Ⓑ ten thousands

   Ⓒ hundred thousands

   Ⓓ millions

7. Julie used her ruler to measure the pencil below. She used 2 different units of measurement.

   Which of these could be the 2 different units of measurements that Julie used?

   Ⓐ 120 millimeters and 12 centimeters

   Ⓑ 12 millimeters and 120 centimeters

   Ⓒ 120 centimeters and 12 meters

   Ⓓ 12 centimeters and 120 meters

**NOTE:** The length measurements may not be exact because of differences in printers.

8. What is the next number in the pattern below?

   12, 19, 26, 33, . . .

   Ⓐ 26

   Ⓑ 33

   Ⓒ 39

   Ⓓ 40

9. Mary has some trading cards. Julie has 3 times as many trading cards as Mary. They have 36 trading cards in all. Which of these equations represents their trading card collection?

   Ⓐ $3x = 36$

   Ⓑ $x + 3 = 36$

   Ⓒ $x + 3x = 36$

   Ⓓ $3x + 36 = x$

10. Alan wants to bring 12 cupcakes to his class party. He can buy cupcakes at the bakeries listed below:

    • Sunrise Bakery sells 3 cupcakes for $1.80
    • Quality Bakery sells 4 cupcakes for $2.20
    • Tasty Bakery sells 6 cupcakes for $3.00

To spend the least amount of money, Alan needs to know how much one cupcake costs at *each* bakery. What is the cost per cupcake at *each* bakery? Show your work and write your answers in the box below.

*[More space provided above]*

Cost per cupcake at Sunrise Bakery: $ _____

Cost per cupcake at Quality Bakery: $ _____

Cost per cupcake at Tasty Bakery: $ _____

11. Dan went to a craft fair where he spent a total of $16.00. He spent $6.00 on admission and went to 8 tables. He spent the same amount of money *(m)* at each table. The following number sentence can be used to find how much money he spent at each table.

    $16 = 6 + 8m$

    How much money did Dan spend at each table?

    Ⓐ $0.50
    Ⓑ $0.80
    Ⓒ $1.25
    Ⓓ $2.00

12. Ms. Nonell's sixth-grade class is going on a fishing trip. The pictograph below shows the number of fish caught each day.

**FISH CAUGHT ON FISHING TRIP**

| Day | Number of Fish |
|---|---|
| Monday | |
| Tuesday | |
| Wednesday | |
| Thursday | |

| Key |
|---|
| = 5 fish |

According to the information in the pictograph, how many fish were caught on Thursday?

Ⓐ 3
Ⓑ 4
Ⓒ 15
Ⓓ 20

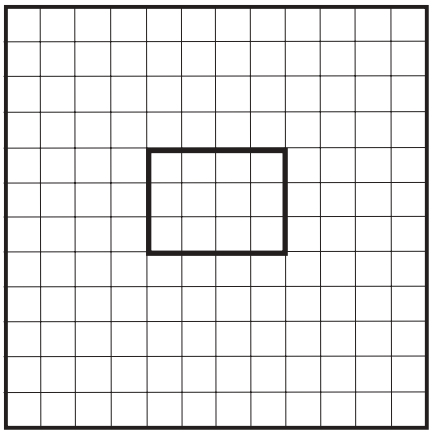
13. Lori entered a 20-kilometer race. A kilometer is about $\frac{5}{8}$ of a mile. About how many miles long is the race?

Ⓐ 8 miles
Ⓑ $12\frac{1}{2}$ miles
Ⓒ $20\frac{5}{8}$ miles
Ⓓ 32 miles

14 A sixth-grade class is growing plants for their science projects. Each student spent $1.00 for a package of seeds and $2.50 for a container to plant the seeds in. There are 30 students in the class. How much money did the sixth-grade class spend on seeds and containers in all?

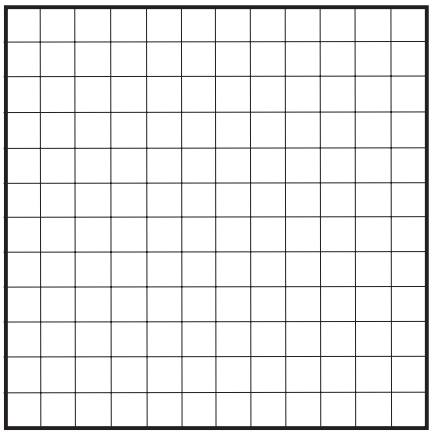
Ⓐ $3.50
Ⓑ $105.00
Ⓒ $165.00
Ⓓ $255.00

15. What is the area, in square units, of the rectangle drawn on the grid below?



Answer: _____ square units

On the grid below, draw a rectangle that has an area of 10 square units.



16. Rachel has to draw two rectangles that are similar to each other. She drew the first rectangle 5 centimeters wide and 6 centimeters long. She drew the second rectangle 10 centimeters wide. How long should she draw the length of the second rectangle?

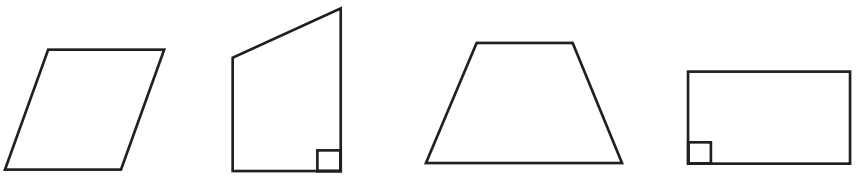
Ⓐ 11 centimeters

Ⓑ 12 centimeters

Ⓒ 15 centimeters

Ⓓ 20 centimeters

17. Which of the figures below is a quadrilateral with 2 pairs of parallel sides and no right angles?



Ⓐ Ⓑ Ⓒ Ⓓ

18. The table below shows the scores 14 students received on a math test.

**MATH SCORES**

| Score | Tally |
|---|---|
| 100 | 𝍸 |
| 95 | 𝍸 \| |
| 90 | \|\| |
| 85 | \| |
| 80 | \|\|\| |

What is the median score?

Ⓐ 85
Ⓑ 90
Ⓒ 95
Ⓓ 100

# SCORING GUIDE—Mathematics, Grade 6

## MULTIPLE-CHOICE QUESTIONS

**Sample A** C

**Sample B** C

1. **C**
2. **C**
3. **C**
5. **B**
6. **B**
7. **A**
8. **D**
9. **C**
11. **C**
12. **D**
13. **B**
14. **B**
16. **B**
17. **A**
18. **C**

## CONSTRUCTED-RESPONSE QUESTIONS

**Sample C**

**Complete and Correct Response**

- 24 minutes

AND

- 4 multiplied by the number of math problems

### 2 Score Points

- 1 point for correct process
- 1 point for correct answer

**Item 4**

**Complete and Correct Response**

- 4 pennies
  3 nickels
  3 dimes

### 2 Score Points

- 2 points for correct answer
- 1 point for any combination of coins that equals $0.49, but does not use exactly 10 coins

**Item 10**

**Complete and Correct Response**

- Sunrise Bakery $1.80 ÷ 3
  Quality Bakery $2.20 ÷ 4
  Tasty Bakery $3.00 ÷ 6

**AND**

- Sunrise Bakery $0.60
  Quality Bakery $0.55
  Tasty Bakery $0.50

### 4 Score Points

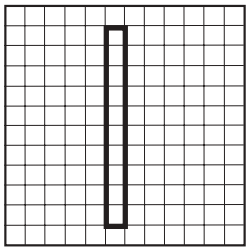
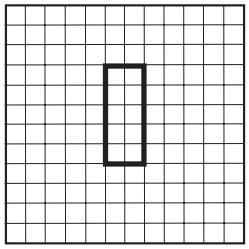
- 1 point for correct process of finding cost per cupcake at Sunrise Bakery, Quality Bakery, and Tasty Bakery
- 1 point for correct cost per cupcake at Sunrise Bakery
- 1 point for correct cost per cupcake at Quality Bakery
- 1 point for correct cost per cupcake at Tasty Bakery

**Item 15**

**Complete and Correct Response**

- 12 square units

**AND**

-  **OR** 

### 2 Score Points

- 1 point for correct area of rectangle
- 1 point for correct drawing of rectangle with an area of 10 square units

# TEST ITEM MAP—Mathematics, Grade 6

Number of Test Questions by Performance Standard

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **A1: Numeration** | **5** | **1** | | **14%** | **7** |
| **A1.2.1** Read, write, model, order, and count with positive whole numbers to 1,000,000 and negative whole numbers. | 1 | | | | |
| **A1.2.2** Use, model and identify place value positions from 0.001 to 1,000,000. | | | | | |
| **A1.2.3** Model and explain the processes of multiplication and division. Describe the relationships among the four basic operations. | | | | | |
| **A1.2.4** Identify and describe different uses for the same numerical representation. | 2 | | | | |
| **A1.2.5** Model and explain the process of adding and subtracting fractions with common denominators and decimals that represent money. | | | | | |
| **A1.2.6** Identify and describe factors and multiples including those factors and multiples common to a pair or set of numbers. | 2 | 1 | | | |
| **A1.2.7** Demonstrate the commutative and identity properties of multiplication. | | | | | |

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **A2: Measurement** | **6** | **1** | | **17%** | **8** |
| **A2.2.1** Estimate and measure weights, lengths, and temperatures to the nearest unit using the metric and standard systems. | 1 | | | | |
| **A2.2.2** Identify and use equivalent measurements (*e.g.*, 60 minutes = 1 hour, 7 days = 1 week). | 2 | 1 | | | |
| **A2.2.3** Use a variety of measuring tools; describe the attribute(s) they measure. | | | | | |
| **A2.2.4** Estimate and measure the dimensions of geometric figures. | 1 | | | | |
| **A2.2.5** Tell time using analog and digital clocks identifying AM and PM; find elapsed time within AM and PM constraints. | 1 | | | | |
| **A2.2.6** Read, write, and use money notation, determining possible combinations of coins and bills to equal given amounts; count back change for any given situation. | 1 | | | | |

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **A3: Estimation and Computation** | **6** | **1** | | **17%** | **8** |
| **A3.2.1** Describe and use a variety of estimation strategies including rounding to the appropriate place value, multiply by powers of 10 and use front-end estimation to check the reasonableness of solutions. | | | | | |
| **A3.2.2** Recall and use basic multiplication and division facts orally, in timed test and as missing factors. *(This will be encompassed in A3.2.3)* | 1 | | | | |
| **A3.2.3** Add and subtract whole numbers and fractions with common denominators to 12 and using models and algorithms. | 2 | | | | |
| **A3.2.4** Multiply and divide whole numbers limiting the 2-digit divisors to those that end in zero; multiply and divide decimals that represent money by whole numbers. | 1 | | | | |
| **A3.2.5** Find equivalent fractions. Convert between fractions and mixed numbers. | | 1 | | | |
| **A3.2.6** Develop and interpret scales and scale models. | 2 | | | | |

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS | | | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| | MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | | |
| **A4: Functions and Relationships** | **5** | **1** | | **15%** | **7** |
| **A4.2.1** Use patterns and their extensions to make predictions and solve problems; describe patterns found in the number system including those formed by multiples, factors, perfect squares, and powers of 10. | | | | | |
| **A4.2.2** Generate and solve simple functions by identifying and applying multiplication and division patterns. | 2 | | | | |
| **A4.2.3** Use a calculator to find a missing item in a number sequence. | | | | | |
| **A4.2.4** Use words, lists, and tables to represent and analyze patterns. *(This will be encompassed in A4.2.3)* | 1 | | | | |
| **A4.2.5** Explain the purpose of variables and use them in open sentences to express relationships and describe simple functions. | 2 | 1 | | | |

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | PERCENT OF EMPHASIS | TOTAL RAW SCORE POINTS |
|---|---|---|---|---|---|
| **A5: Geometry** | **5** | | **1** | **19%** | **9** |
| **A5.2.1** Identify and compare various triangles and quadrilaterals according to their sides and/or angles. | 2 | | | | |
| **A5.2.2** Compare and contrast plane and solid figures (*e.g.,* circle/sphere, square/cube, triangle/pyramid) using relevant attributes, including the number of vertices, edges, and the number and shape of faces. | 1 | | | | |
| **A5.2.3** Identify and model geometric figures that are congruent, similar, and/or symmetrical. | | | | | |
| **A5.2.4** Distinguish between area and perimeter; find both using a variety of methods including rulers, grid paper, and tiles. | | | 1 | | |
| **A5.2.5** Identify and model transformations of geometric figures and rotations of line segments, describing the motions as slides, flips, or rotations. | 1 | | | | |
| **A5.2.6** Locate and describe objects in terms of their position with and without compass directions; identify coordinates for a given point or locate points of given coordinates on a grid. | 1 | | | | |
| **A5.2.7** Sketch and identify line segments, midpoints, intersections, parallel and perpendicular lines. | | | | | |

| PERFORMANCE STANDARDS | NUMBER OF TEST QUESTIONS MULTIPLE-CHOICE | SHORT RESPONSE | EXTENDED RESPONSE | PERCENT OF EMPHASIS | |
|---|---|---|---|---|---|
| **A6: Statistics and Probability** | **1** | **2** | **1** | **18%** | **9** |
| **A6.2.1** Collect, organize, and display data creating a variety of visual displays including tables, charts, and line graphs. | | | 1 | | |
| **A6.2.2** Present the data using a variety of appropriate representations and explain the meaning of the data. | 1 | | | | |
| **A6.2.3** Describe and interpret a data set using mean, median, mode, and range. | | 1 | | | |
| **A6.2.5** Estimate whether a game is mathematically fair or unfair; analyze and present probability data using simple fractions. | | 1 | | | |
| **A6.2.6** Conduct simple probability experiments using concrete materials and represent the results using fractions and probability. | | | | | |


# APPENDIX 3
## Proficiency Descriptors

# PROFICIENCY DESCRIPTORS

## WHAT PROFICIENCY DESCRIPTORS CAN TELL TEACHERS, STUDENTS, AND PARENTS

Students can demonstrate four levels of proficiency on each subject area test of the Grade 6 Alaska Benchmark Examination. Students' scores are interpreted to indicate that their performance is ***advanced, proficient, below proficient*** or ***not proficient*** in each subject area—reading, writing, and mathematics. To give more specific information about what these ratings mean, the committees that established the "cut scores" to distinguish among the ratings developed a series of **PROFICIENCY DESCRIPTORS.** The descriptors can help parents, teachers, and students to understand how far students have progressed in mastering the content and skills that are assessed on the Benchmark Examinations.

A score at a given performance level indicates that a student's work on a particular test demonstrates the majority of skills and content characterized by that level and even more of what is described for the levels below. Some students may achieve some of the competencies described in the next level as well, but not well enough to have scored at that next level.

The short forms of the proficiency descriptors are printed out for students and parents on the score cards they receive after the examination. These give general information about what the student knows and can do. Longer versions of the descriptors describe proficiencies in greater detail, giving teachers and administrators specific information for establishing instructional priorities and helping students meet the performance standards for their age group.

Both short and long forms of the proficiency descriptors are included in this appendix. In some cases, because of the nature of certain competencies, the long forms describe proficiency at only one or two of the three proficiency levels.

## PROFICIENCY DESCRIPTORS
## READING, GRADE 6—Short Form

### BELOW PROFICIENT

The student uses context clues; understands and relates multiple meanings of words; demonstrates understanding of synonyms; infers the meaning of figurative language; recognizes themes; identifies similarities between various situations; restates details from text; identifies a main idea and provides some supporting details; differentiates and logically organizes steps in a set of directions; and identifies and compares main characters, plots, and settings.

### PROFICIENT

The student uses word origins to determine the meaning of unfamiliar words; identifies multiple synonyms of a word; explains an author's meaning; summarizes information; makes connections between main ideas and concepts in one passage to related topics; provides supporting details; interprets and applies information from a key; identifies characteristics of a poem; differentiates fiction from nonfiction; identifies literature genres; identifies meaning of figurative language; draws conclusions; and clarifies and expresses opinions based on text.

### ADVANCED

The student uses tables and headings for a purpose; infers an author's meaning from text; uses prior knowledge to support and justify an author's main ideas; interprets complex directions to understand and solve problems; predicts story outcomes based on knowledge of literature genres; explains the differences between fiction and nonfiction; discriminates between main plot and subplots, main and minor characters, and elements of a setting; and analyzes an author's opinion or point of view and supports opinions with information from the text.

# PROFICIENCY DESCRIPTORS
# READING, GRADE 6—Long Form

## Uses reading strategies to determine meaning

**The below proficient student**

- Uses context clues, understands and relates multiple meanings of words, and demonstrates an understanding of synonyms.

**The proficient student**

- Uses word origins to determine the meaning of unfamiliar words and identifies multiple synonyms of a word.

**The advanced student**

- Reads for information (*i.e.,* uses tables and headings according to the purpose or task).

## Infers meaning and identifies themes

**The below proficient student**

- Infers the meaning of figurative language from the text, recognizes themes, and identifies similarities between various situations.

**The proficient student**

- Explains an author's meaning.

**The advanced student**

- Infers the author's meaning from the text.

## Summarizes information

**The below proficient student**

- Finds and restates detail from the text.

**The proficient student**

- Summarizes information from the text.

## Connects main ideas

**The below proficient student**

- Identifies a main idea and provides some supporting details.

**The proficient student**

- Makes connections between the main ideas and concepts in one passage to related topics and provides supporting details.

**The advanced student**

- Uses prior knowledge to support and justify an author's main ideas.

## Follows multi-step directions

**The below proficient student**

- Differentiates and logically organizes steps in a set of directions.

**The proficient student**

- Interprets and applies information from a key.

**The advanced student**

- Interprets complex directions to understand and solve problems.

**Describes forms of texts**

**The proficient student**

- Shows understanding of a variety of types of texts (e.g., identifies the characteristics of a poem, recognizes fiction vs. nonfiction, identifies the type of literature).
- Identifies the meaning of figurative language.

**The advanced student**

- Predicts story outcomes based on knowledge of types of literature, and explains the differences between fiction and nonfiction.

**Defines basic story elements**

**The below proficient student**

- Demonstrates understanding of story elements (e.g., identifies main characters, plots, and settings), compares different plots, settings, and characters.

**The advanced student**

- Discriminates between main plot and subplots, main and minor characters, and elements of a setting in a written selection.

**Differentiates fact from opinion**

**The proficient student**

- Draws conclusions and critiques text (i.e., clarifies and expresses opinions based on text).

**The advanced student**

- Analyzes the author's opinion or point of view and supports opinions with information from the text.

## PROFICIENCY DESCRIPTORS
## WRITING, GRADE 6—Short Form

**BELOW PROFICIENT**

The student writes a loosely defined story, topic, or idea in simple sentences or fragments; locates and corrects the most obvious common errors in spelling, punctuation, and grammar; and combines simple sentences to eliminate repetition.

**PROFICIENT**

The student writes on a topic with broad development in a somewhat organized manner; uses accurate but simple sentence construction and basically correct writing conventions; makes word choices that are appropriate but not colorful; uses limited but relevant supporting details; demonstrates awareness of audience; locates and corrects errors in spelling, punctuation, and subject/verb agreement; combines sentences to make writing concise; and adds supporting details to improve paragraph structure.

**ADVANCED**

The student defines and develops a topic in an organized way, uses a variety of sentence structures, accurate and colorful word choice, and relevant supporting details with clear voice; locates and corrects spelling, punctuation, and grammar errors consistently; identifies structural errors in complex sentences; and correctly uses adverbs of comparison, appropriate verb tense, and pronouns.

# PROFICIENCY DESCRIPTORS
# WRITING, GRADE 6—Long Form

## Writes about a topic

**The below proficient student**

- Writes a topic, idea, or story line that is loosely defined.
- Writes with simple sentences and sentence fragments.

**The proficient student**

- Writes on a topic with broad development.
- Develops the topic in a somewhat organized manner.
- Uses accurate but simple sentence construction.
- Uses conventions that are mostly correct and includes errors that do not interfere with meaning.
- Makes word choices that are appropriate but may not be colorful or figurative.
- Uses limited but relevant supporting details.
- Demonstrates awareness of audience and voice.

**The advanced student**

- Defines and develops the topic in a logical, sequential way.
- Uses a variety of sentence lengths and structures.
- Makes few, if any, errors in conventions.
- Chooses words that are accurate and colorful, including some figurative language.
- Uses supporting details that are relevant.
- Writes with clear voice.

## Proofreads writing

**The below proficient student**

- Locates and corrects the most obvious common spelling, punctuation, and grammatical errors in a written passage.

**The proficient student**

- Locates and corrects errors in
  - spelling.
  - punctuation.
  - verb, pronoun, and homonym usage.
  - punctuation of contractions.
  - subject/verb agreement.
  - comparative adjectives.
  - sentence fragments.

**The advanced student**

- Consistently locates and corrects errors in spelling, punctuation, and grammar.
- Identifies structural errors in more complex sentences.
- Correctly uses adverbs of comparison, appropriate verb tense, and pronouns referring to antecedents.

**Revises writing to provide supporting detail**

**The below proficient student**

- Combines simple sentences to eliminate repetition.

**The proficient student**

- Combines sentences using conjunctions to make writing concise.
- Improves paragraph structure by adding supporting details in appropriate locations.

**The advanced student**

- Combines sentences to clarify relationships between ideas.
- Eliminates irrelevant sentences from paragraphs.
- Provides relevant details to support a topic sentence.

## PROFICIENCY DESCRIPTORS
# MATHEMATICS, GRADE 6—Short Form

**BELOW PROFICIENT**

The student can identify a limited range of place values, identify number multiples, and read and write positive whole numbers; measure distances, determine elapsed time, choose appropriate units of measure, and recognize and use currency; add and subtract decimals and use basic multiplication and division facts; solve problems by extending numeric patterns, completing mathematical sentences, and extending geometric patterns; identify properties of geometric shapes; and start graph construction by labeling the axes or providing a title.

**PROFICIENT**

The student can describe factors, multiples, and place values; use equivalent measures, solve simple volume problems, and show a strategy to solve time/distance problems; solve multi-step computation problems and problems involving fractions, add and subtract fractions with common denominators, and find equivalent fractions; determine and extend complex numerical patterns; identify parallel lines and describe geometric transformations; interpret a graph, construct a graph with some errors, and determine whether a game is mathematically fair.

**ADVANCED**

The student can solve multi-step problems involving factors, multiples, and length; determine a scale from given information and use a scale containing fractions to solve a problem; explain how to determine missing numbers in numeric patterns and solve mathematical equations; describe methods for finding area and perimeter and identify characteristics of solid shapes, line segments, intersecting and perpendicular lines, angles, and transformations; make a graph, determine an average, and explain how a probability outcome can be changed.

## PROFICIENCY DESCRIPTORS
# MATHEMATICS, GRADE 6—Long Form

**Numeration**

The below proficient student

- Models and identifies place-value positions from hundredths to ten thousands.
- Identifies multiples of numbers such as three, four, and five.
- Reads and writes positive whole numbers.

**The proficient student**

- Identifies and describes factors and multiples common to a set of numbers.
- Identifies place value positions from thousandths to millions.

**The advanced student**

- Solves multi-step problems that involve factors and multiples.

## Measurement

**The below proficient student**

- Estimates and measures the dimensions of a geometric figure.
- Determines elapsed time using clocks.
- Estimates and measures fractions of units of measurement.
- Chooses appropriate units of measurement in metric or standard units.
- Recognizes the values of coins and fractional parts of a dollar.
- Combines coins to equal a required amount.

**The proficient student**

- Uses equivalent measures to compare objects.
- Solves one-step problems involving measurement of volume.
- Shows a strategy to solve problems involving time and distance.

**The advanced student**

- Solves multi-step problems involving measurement of length.

## Estimation and Computation

**The below proficient student**

- Adds and subtracts whole numbers and decimals, including money amounts.
- Recalls and uses basic multiplication and division facts.

**The proficient student**

- Solves multi-step problems involving addition and subtraction of whole numbers and decimals, including amounts of money.
- Uses a scale drawing to solve a problem.
- Adds and subtracts fractions with common denominators.
- Finds equivalent fractions.
- Solves multi-step problems to determine fractional parts of a set.

**The advanced student**

- Determines a scale from given information.
- Uses a scale containing fractions to solve a problem.

## Functions and Relationships

**The below proficient student**

- Solves simple problems by determining and applying a basic pattern.
- Uses patterns to make predictions.
- Completes sentences with missing numbers.
- Determines and extends a geometric pattern.

**The proficient student**

- Determines and extends more complex numerical patterns.

**The advanced student**

- Analyzes an alternating numerical pattern and explains how to determine a missing number.
- Analyzes numeric patterns to identify missing numbers.
- Solves mathematical equations for unknowns using greater than, less than, and equal to notation.

## Geometry

**The below proficient student**

- Identifies properties of geometric shapes.

**The proficient student**

- Identifies parallel lines.
- Identifies and uses mathematical vocabulary to describe geometric transformations.

**The advanced student**

- Interprets directions accurately.
- Describes methods for finding area and perimeter of shapes.
- Identifies characteristics of solid figures including number and shapes of faces.
- Identifies line segments, and intersecting and perpendicular lines.
- Identifies types of angles within geometric figures.
- Identifies transformation of geometric figures describing motions.

## Statistics and Probability

**The below proficient student**

- Starts the construction of a graph by labeling the axes or providing a title.

**The proficient student**

- Interprets a graph.
- Establishes a consistent graphing scale and accurately graphs some given data.
- Determines whether a game is mathematically fair or unfair.

**The advanced student**

- Makes a graph with only minor errors.
- Determines the average of a set of three-digit numbers.
- Explains how the outcome of a probability problem can be changed.

# APPENDIX 4

## An Overview of Standards and the Comprehensive System of Student Assessment in Alaska

## AN OVERVIEW OF ALASKA'S STANDARDS AND THE ALASKA BENCHMARK EXAMINATIONS

Beginning in 1993 and 1994 the Alaska State Board of Education & Early Development adopted content standards for students in 10 areas—English/language arts, mathematics, science, geography, government and citizenship, history, skills for a healthy life, arts, world languages, and technology. Later, the Board adopted employability standards and endorsed the cultural standards for students developed by the Alaska Native Knowledge Network in 1998. All of these standards are broad statements of what students should know and be able to do as a result of their twelve years of public schooling.

In addition to the broad statements of what students should know and be able to do that are laid out in the **content standards,** more specific statements of what students should know and be able to do were expressed in student **performance standards** for three subject areas—reading, writing, and mathematics. The reading and writing performance standards are more specific statements of the content standards in English/language arts. The mathematics performance standards are more specific statements of the content standards in mathematics.

Performance standards were written for four age groups of students and are commonly referred to as **benchmarks.** The first benchmark is for students ages 5-7; the second for students ages 8-10; the third for students ages 11-14; and the fourth for students ages 15-18. The fourth benchmark is also referred to as the high school benchmark.

The Alaska Comprehensive System of Student Assessments calls for **Benchmark Assessments** to be administered to all students across the state in grades 3, 6, and 8 in reading, writing, and mathematics. In addition, the High School Graduation Qualifying Exam can be administered to high school students beginning in their second semester of the 10th grade. The correspondence between benchmark age groups and the grade levels offered in traditional schools is as follows:

| Benchmark | Age Group | Grades when students are instructed on standards | Grade level of benchmark exam |
|---|---|---|---|
| 1 | 5-7 yrs | Grades K-2 | Grade 3 |
| 2 | 8-10 yrs | Grades 3-5 | Grade 6 |
| 3 | 11-14 yrs | Grades 6-8 | Grade 8 |
| High School | 15-18 yrs | Grades 9-12 | Grades 10-12 |

The information in this table provides a guideline for schools and not a requirement. Students progress at different rates over their public school careers, and local school districts have clear authority to establish their own curricula and instructional programs within the constraints of state statutes and regulations. An instructional and curricular sequence based on these guidelines, however, would clearly offer students an excellent opportunity to learn the standards and do well on the benchmark examinations and the High School Graduation Qualifying Exam.

The four Benchmark Assessments are part of the **Alaska Comprehensive System of Student Assessments,** a program designed to provide ongoing information about performance on the reading, writing, and mathematics performance standards throughout a student's K-12 educational experience. The system provides for continual monitoring of student progress and will help alert schools when students need additional assistance in mastering the standards well before they take the High School Graduation Qualifying Exam.

The components of the Comprehensive System of Student Assessments are displayed in the following table:

| Components of the Comprehensive System of Student Assessments | Grade at which Administered |
|---|---|
| Developmental Profile | Kindergarten & entering grade 1 |
| Benchmark 1 Assessment | Grade 3 |
| Norm-referenced Test | Grade 4 |
| Norm-referenced Test | Grade 5 |
| Benchmark 2 Assessment | Grade 6 |
| Norm-referenced Test | Grade 7 |
| Benchmark 3 Assessment | Grade 8 |
| Norm-referenced Test | Grade 9 |
| High School Graduation Qualifying Examination | First offered in spring of grade 10. Students can continue taking until they pass all three parts. Offered again twice a year in grades 11 and 12, and twice a year for up to 3 years after completion of high school. |

The **Developmental Profile** is administered to kindergarten students or first grade students entering the public schools for the first time. It asks the teachers of these students to record students' developmental readiness using 11 indicators and to record background characteristics in three areas. *For more information see the Alaska Kindergarten/First Grade Profile section on the Alaska Department of Education & Early Development web site: (www.eed.state.ak.us).*

As discussed above, the **Benchmark Assessments** given to students in grades 3, 6, and 8 measure student performance in relation to statewide standards for reading, writing, and mathematics. These standards are developmentally related to the standards for high school students, and they monitor students' progress over their 12-year public school experience.

Beginning in March 2002, students in grades 4, 5, 7, and 9 will be given a **Norm-referenced Test,** Terra Nova, *The Second Edition©*. Norm-referenced tests are valuable because they provide information about how well students in Alaska compare with students nationally. The Benchmark Assessments and the High School Graduation Qualifying Exam cannot be used to compare Alaska students with students in other states or the nation because they are unique tests that measure how well students have achieved the Alaska Performance Standards in Reading, Writing, and Mathematics.

On the basis of student data from all these tests, the Department of Education & Early Development will begin in August 2002 to issue **School Designators** for each of the 500 schools in the state. Schools will be designated as distinguished, successful, deficient, or in crisis.

*For more information see* Frequently Asked Questions, Proficiency Descriptors, *and* Alaska Content and Performance Standards in Reading, Writing and Mathematics *in this teacher's guide; or visit the Department of Education & Early Development web site: (www.eed.state.ak.us).*

# ACKNOWLEDGMENTS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Richard Smiley, Ph.D., *Administrator, Alternative Assessments*
Nicholas Stayrook, Ph.D., *Director, Program Planning and Evaluation*
*Fairbanks North Star Borough School District*
Ardy Smith Miller, Ph.D., *Administrator, Reading/Language Arts*
Bev Smith, *Math Specialist*
Nanci Spear, *Math Specialist*
Thanks also to Sharon Early, Bobbie Lowden, and members of the Resource Document Work Groups for their work on Suggested Activities.

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The following committees composed of parents, teachers, public school administrators, and university professors contributed their time and expertise to make sure the Alaska Benchmark Examinations meet the high standards and expectations of Alaskans:

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# FOR MORE INFORMATION

Mark Leal, Administrator, Assessments & Student Information
Alaska Department of Education & Early Development
801 West Tenth St., Suite 200
Juneau, AK 99801-1894
(907) 465-8691
mark_leal@eed.state.ak.us